Veterinary Medicine

VOL. XXII JUNE, 1927 No. 6

Published Monthly by the Veterinary Magazine Corporation
4753 South Parkway, Chicago, Ill., U. S. A.
$4.00 a Year
Entered as second-class matter, July 19, 1910, at Chicago, Ill., under Act of Congress of March 3, 1879.
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KANSAS STATE AGRICULTURAL COLLEGE MAY 22 '27 LIBRARY

A "Famous Editorial"

A VERY distinguished veterinarian, moved no doubt by a desire to contribute to the general information of the profession and to promote harmony in its ranks has seen fit, recently, to refer in a quasi-public manner to an editorial published in this magazine seven years ago—in the July issue of 1920.

The veterinarian concerned is of irreproachable standing, and his motives are widely recognized as being unimpeachable; therefore it cannot be due to other than lapses of memory that he confuses his dates and draws conclusions that cannot be but reversed by a consideration of the sequence of events.

Another matter which the secretary of the Illinois Veterinary Medical Association seems to think important had perhaps better be restated in the interest of accuracy. The secretary of the Illinois Veterinary Association in 1920 was not a member of the committee that formulated the agreement with representatives of the Illinois Agricultural Association—the agreement regarding swine vaccination that was later (after publication of the "famous" editorial) confirmed without substantial change by the veterinary association of the state and then publicly repudiated by 175 of its members. The secretary of the association learned of this committee only after it convened in Chicago and when he was telephoned for some information desired by the committee.

As to qualities of leadership of the Illinois association prior to 1920 will the gentleman pardon another correction? The writer has made no "acknowledgment" nor expressed an opinion on the subject; nor has he discussed the quality of leadership of the association at this time. During 1920, however, and for a year or two following, time has shown the policies of the association to have been very costly to its members in practice and prestige. If this were not common knowledge, the report of the secretary of the association, dealing with this subject, might be cited in support of this statement. This report was in part published on page 92 of the March issue of VETERINARY MEDICINE and need not be repeated here.

Referring to the editorial, "Taking the Graft Out of Swine Vaccination," as a "famous editorial," is a much appreciated kindness. One achieves such distinction so seldom. This may be said for the editorial; although on a controversial subject no one has as yet pointed out a single inaccurate statement in it. But perhaps other memories are as faulty as Doctor Welch's, so here is this famous editorial reprinted that discussions of it may be confined to actualities and not to the annihilation of straw men.

Taking the Graft Out of Swine Vaccination

For the last five or six years, veterinarians in the Mississippi Valley and other regions where swine-raising is an important industry have been applying themselves assiduously to the study of swine diseases, and, of course, particularly hog cholera and its pre-

vention. During the past three years, the subject of swine disease has occupied the most conspicuous place on the programs of the Missouri Valley Veterinary Association and the Illinois State Veterinary Medical Association. It has had an important place on the programs of all the state and local veterinary meetings in the swine-raising section of our country, and at many meetings the discussions have been confined to this topic to the exclusion of all others.

This intensive and continuous study of swine diseases has been most fruitful. The profession, as a whole, has advanced immeasurably in its understanding of the subject, and although much, very much, remains to be worked out, the average expertness of veterinarians in the treatment of the diseases of swine may now be said to be only a little less than in the treatment of cattle and seems to warrant the conclusion that in the not distant future swine practice will be handled with as great a degree of skill and exactitude by the average veterinarian as is horse practice, upon which the profession has been accumulating information for upwards of 200 years.

But while leading veterinarians and the veterinary associations were devoting their time and effort to the acquisition of knowledge on the scientific aspects of the subject, practical matters concerning the application of the information so gained were almost wholly neglected, and certain abuses, *not common, but nevertheless important,* have grown almost unrestrained. While the best men in the profession were applying themselves unreservedly to the elucidation of the facts concerning the cause, diagnosis, treatment and prevention of diseases of swine, certain short-sighted and avaricious members have not hesitated to use the information so gained for their own pecuniary profit; to establish a price for vaccination at the maximum the traffic would bear, and by this means to bring a certain amount of discredit upon the work of all veterinarians and an insistent demand by farmers and farm organizations that the work of vaccinating hogs be placed in other and fairer hands.

It is not necessary for us to say that an exorbitant price for vaccination for the prevention of cholera, or more than a fair price, is not for the best interests of either the swine-raiser or the veterinarian, for our readers already know this, and we believe there are *few indeed* among them whose standard of ethics is so low that they desire to mulct an important part of the industry that furnishes them a livelihood, or are such poor business men as not to foresee that *such a policy must be shortlived and in the end disastrous.*

During the past two years the uncertain and varying price of serum has increased the opportunities for overcharging for serum used in vaccination. Further, the uncertainty as to just what the serum used on any given herd of hogs cost, doubtless has led the farmers and the farm advisers to suspect "profiteering" in numerous instances where it did not exist.

Under such circumstances it was inevitable that a clash should occur if a better understanding were not arrived at between the farmer organizations and the veterinary associations and a fair basis for co-operation were not arrived at—*a clash that admittedly would be bad for both sides and* might set the swine industry and swine practice back a decade. In Iowa and Illinois representatives of the swine-raisers, county farm bureaus and the veterinarians of the state have agreed upon a plan for the fullest co-operation, a plan that it is believed will ultimately increase the amount of vaccination for the prevention of hog cholera in the states very largely and thus benefit both the swine industry and the veterinarian, a plan that is at the same time absolutely fair to both sides.

The plans are as yet only tentative. They require to be approved by the state veterinary association and the farmers' association before they are operative, but they are fair and just and right, and the agreement as outlined should prevail and we believe will.

In Illinois, where farm advisers, or county agents as they are commonly called, have been the longest known and where there are more of them than in other states, these men are opposed to vaccination by

other than veterinarians. The Illinois state association of farm advisers has officially gone on record in this matter in the following definite statement:

We favor legislation or regulations prohibiting the distribution of hog cholera virus to others than licensed veterinarians, and further that farm advisers do not vaccinate hogs.

This was unanimously adopted at a meeting where sixty-five of the eighty-four farm advisers in the state were present. We believe that, with numerous exceptions, the attitude of farm advisers is the same elsewhere, and that it is in most instances the belief (often mistaken no doubt) that local veterinarians are not meeting their responsibility as they should, either because of alleged poor work that has been done or a belief that the farmers have been overcharged that has led them to assume a different attitude.

At its annual meeting a year ago, the Illinois Veterinary Medical Association formally adopted a resolution requiring all members of the association to, when requested, supply their clients with an itemized bill for vaccination, showing the actual cost of the serum and virus to the veterinarian and the charge for services. The farmers agreed that this was a step in the right direction, but believed that something more was necessary to eliminate the opportunities for overcharging for serum on the part of some veterinarians and made the following proposition:

To restore and maintain the confidence of the breeders and farmers, it is fundamental:

First: That in submitting his statement or bill for services rendered, the veterinarian separate the items into charges for serum, for professional services and for mileage, if such charge is made.

Second: That the charges made by the veterinarian for serum should be identically its net cost to him, plus a conservative percentage to cover handling, breakage, losses, etc., which in no case is to exceed 25 per cent. The veterinarian should state the particular kind and brand of serum and virus used and the serial number of each. This statement should be rendered on a uniform blank agreed upon by the joint committee of the State Veterinary Medical Association and the Illinois Agricultural Association.

Furthermore, the breeder, or farmer, may reserve the right to designate or furnish the serum secured through the Farm Bureau or otherwise, which the veterinarian uses on his herd.

Third: It is recognized that the professional skill and services of veterinarians, and the actual time employed in immunizing different herds vary to such an extent as to render a uniform charge for professional services impracticable. The Illinois Agricultural Association does not, therefore, undertake to say what such charges shall be. It does suggest that the Illinois State Veterinary Medical Association inspire its members with the attitude that such charges should be conservative and reasonable and in keeping with the services rendered and the professional skill required.

Fourth: In the interests of promoting better feeling among stock men and stimulating better veterinary service in the state, it is suggested that a joint committee of six be appointed, three of whom shall be active veterinary practitioners and members of the Illinois Veterinary Medical Association, and three members of the Illinois Agricultural Association, whose function it shall be to consider suggestions, questions, and complaints referred to it from time to time by individuals or by either association.

A conference was held by the representatives of the Illinois Agricultural Association and the Illinois Veterinary Medical Association and the foregoing agreed upon. It will come before the State Veterinary Association for approval or rejection at its summer meeting in Champaign.

Such a plan will not meet the approval of the veterinarian who has been profiteering in the matter of swine vaccination, but that doesn't matter. His game is about up anyhow and should have been ended long ago before it brought the discredit that it has already brought to *that great majority of the profession who have been honest and fair and square in the matter of swine vaccination.* It may not meet the approval of some veterinarians who have been honest and fair in their dealings with their clients, but who regard the medicaments that a veterinarian uses and their cost exclusively the veterinarian's affair.

While such an argument has force, we do not believe it should prevail. The veterinarian is not a serum merchant primarily, but a professional man, and *his function is not so much to supply his clients with serum as it is to use it skillfully.*

In the long run, the farmer pays for the serum and the hogs are his. He is justly entitled to say what serum shall be used and to know what it costs. He pays for the veterinarian's skill and, of course, is entitled

to select the veterinarian and to know what he is to pay for his services.

A blanket bill for vaccination, including the professional fee, mileage and the cost of serum and virus, not only does not give the owner of the swine information to which, as one of the interested parties, he is justly entitled, but it is bad business policy in that it offers an opportunity for overcharging by the avaricious and grounds for suspecting overcharging where it does not occur.

The foregoing agreement does not set a price upon any man's work, but leaves that

International News Reel Photo

The small animal clinic at the recent veterinary conference at the University of Pennsylvania.

for a matter of agreement between the veterinarian and his client. It does eliminate the opportunity for charging a client more than a reasonable profit for the serum used on his herd, and to this no veterinarian who has the welfare of the live stock industry and his profession at heart will object. *If its provisions are carried out faithfully by both parties to the agreement, it will eliminate the chief cause for complaint that the farmer organizations and county agents have raised against veterinarians and should do more than anything else to restore and maintain confidence in swine vaccination and to place this work where it belongs, in the hands of veterinarians.*

If it works out successfully in Illinois and in Iowa where similar negotiations are under way, the plan will undoubtedly be extended to other states.

The italics in the foregoing have been used in this reprint to call particular attention to these portions because of the trend of subsequent events.

SMALL ANIMALS FURNISH 93% OF COLLEGE CLINIC

During 1926 a total of 9,339 animals were treated in the Veterinary Hospital and Free Dispensary of the University of Pennsylvania, an average of more than 25 animals daily; but, as the free dispensary was not open on Sundays or holidays, the average for the working days was probably considerably higher.

The surgical cases among large animals numbered 233, of which 110 were given general anesthesia, a very high percentage. Of the 233 cases, 17 died (15 of them being destroyed) and 216 were discharged. Among the operations, other than the suture of wounds, that for hemiplegia laryngis stood first with 18 and neurectomy second with 14. There were no deaths among these cases.

In the medical clinic for large animals, azoturia was the predominating cause of disability, comprising 39, or just one-half, of the total of 78 cases treated. Of the azoturia cases 24, or nearly 62 per cent, died or were destroyed. Heat prostration was, next to azoturia, the most prolific cause of disability, accounting for 8 cases, of which 4 died.

In the clinic for small animals, the free dispensary cases numbered 4,886, and the hospital cases 3,836, a total of 8,722, or more than 93 per cent of the total number of cases treated in the hospital and at the free dispensary. Of the cases treated in the small animal clinic, dogs comprised 7,767, or more than 89 per cent; cats 912, or 10.4 per cent.

In addition to the hospital and free dispensary, the school conducted an ambulatory clinic, in which there was a greater diversity of cases, including 616 cases in horses, 2,193 cases in cattle, 398 cases in swine, 274 in poultry and three in sheep, a total of 3,484.

STATE AGRICULTURAL COL... MAY 21 1927

SALARIES IN THE B. A. I.

The recent resignation of Dr. A. A. Swaim, an outstanding member of the local B. A. I. force in Chicago, to accept a position with one of the packers at just twice the salary he was receiving in the Bureau is just another of a very considerable list of examples of the loss of the B. A. I. service and of the public because Congress neglects to appropriate sufficient funds to pay salaries in keeping with responsibility and ability that is expected of veterinarians in the Bureau.

Not only does Doctor Swaim increase his income by changing from the Bureau service to the service of private industry, but as in the case of most of his predecessors over this same road, he has improved in an even greater degree his prospects for the future.

Doctor Swaim goes to Wilson. Within very recent years, Drs. J. J. Hays and W. W. Lawson, both also of the Chicago force, have resigned their B. A. I. positions for employment at something like 100 per cent increase in salaries with Armour. Dr. J. M. Hanley, also of the Chicago force, left the Bureau under similar circumstances for employment with the Stock Yards Company, as did his predecessor, Dr. S. E. Bennett.

O. E. Dyson, Fred Eagle, J. P. Iverson, A. Eichhorn, V. A. Moore, S. Stewart, Tait Butler and Theodore Smith are but a few of those whose services the Bureau could ill afford to lose but who in justice to themselves and their families, could not afford to remain in the Bureau service.

As the largest employer of veterinarians (employing about 1350) the Bureau of Animal Industry exercises an effect that is practically determining on the salaries paid veterinarians in state, county and municipal positions and to a less though appreciable degree, on the salaries paid for veterinary positions in private industry.

The salaries paid veterinary officials exercise no small influence on the public's estimate of the value of all veterinary service and thus the inadequate salaries paid B. A. I. veterinarians becomes of concern to every veterinary practitioner as well as to every salaried veterinarian. The A. V. M. A. has long recognized this, and labored as an organization for better salaries for veterinarians in the Bureau. The cause, however, deserves a more wholehearted support by practitioners as individuals.

The Bureau veterinarians themselves are making a determined effort for more adequate salaries. As a part of their plan, they have recently addressed the following letter to the Chief of the Bureau, who is believed to regard increased salaries for veterinarians in the B. A. I. as necessary to the continued efficiency of the force:

Dear Dr. Mohler:

As officers of the National Association of Bureau of Animal Industry Veterinarians, and by direction of the membership of that Association, we respectfully call to your attention the pressing necessity for an increase in appropriations available for salaries for the veterinarians in the Bureau.

It is our understanding that the estimates for the Bureau for the fiscal year beginning July 1, 1928, are now, or very soon will be, in course of preparation, and in that connection we respectfully ask you to give sympathetic consideration to the following facts.

As of March 1, 1927, there were 1,291 veterinarians, hereinafter referred to as the field force, in the employ of the Bureau of Animal Industry outside of Washington. There were also 33 veterinarians employed in Washington, including the Chief of the Bureau and his administrative and research staff and three traveling inspectors.

The salaries and the average length of service in each salary class, of the 1,291 Veterinarians in the Field Force, are shown in the following tabulation:

162	at	$1860—avg.	service.....	2 years
1	at	2000—avg.	service.....	24 years
89	at	2100—avg.	service.....	5 years
625	at	2400—avg.	service.....	13 years
161	at	2500—avg.	service.....	22 years
29	at	2600—avg.	service.....	18 years
73	at	2700—avg.	service.....	16 years
36	at	3000—avg.	service.....	22 years
12	at	2900—avg.	service.....	21 years
32	at	3000—avg.	service.....	22 years
21	at	3100—avg.	service.....	20 years
3	at	3200—avg.	service.....	22 years
16	at	3300—avg.	service.....	25 years
1	at	3400—avg.	service.....	29 years
7	at	3500—avg.	service.....	21 years
1	at	3600—avg.	service.....	27 years
16	at	3800—avg.	service.....	23 years
4	at	4000—avg.	service.....	28 years
1	at	4600—avg.	service.....	29 years
1	at	5600—avg.	service.....	40 years

The average annual salary of field veterinarians of the Bureau of Animal Industry, including inspectors in charge and other men in key positions in the field, is only $2,435.03.

The total payroll for the field force of veterinarians is $3,143,620 per annum.

The Association asks you to request in the

estimates for the fiscal year beginning July 1, 1928, an increase in appropriations at least sufficient to make the following promotions as of that date:

(a) For each veterinarian who has served two years in the $1860 grade, with an acceptable efficiency record, a promotion to $2100 per annum.

(b) For each veterinarian between $2100 and $2800, with an acceptable efficiency record, a promotion of $200 per annum.

(c) For each veterinarian at the $2900 grade, with an acceptable efficiency record, a promotion of $100 per annum.

(d) For the veterinarians in Washington including the traveling inspectors, and for the veterinarians in the field who receive $3000 per annum or over, a sum sufficient to make the promotions which in the judgment of the Chief should be made. It is the opinion of the Association that, not only the rank and file of the Bureau, but also the key men in administrative and research positions are underpaid as compared with other professional men in the Government service.

The Association estimates that the sum necessary to make the above promotions for field force at $3000 per annum or under will not exceed $210,000, which is an increase in the total field payroll of slightly less than 7 per cent. A further sum of $40,000 would, it is thought, take care adequately of the Washington force and of that small portion of the field force now receiving over $3000 per annum.

The Association further requests you to declare a fixed plan of promotion for the rank and file field veterinary force for men with acceptable efficiency records, subject of course to securing the necessary appropriations from Congress from year to year.

As a modest start in this direction, the Association suggests that the following fixed promotion plan to include rank and file men and also men in minor supervisory positions.

(a) A promotion from $1860 to $2100 for each veterinarian with an acceptable efficiency record when two years' service is reached.

(b) A promotion of $100 per year for each veterinarian with an acceptable efficiency record receiving from $2100 to $2900 until a salary of $3000 per annum is reached.

It will be noticed that by far the greater number of veterinarians is in the $2400 grade with a considerable number of $2500. At present $2400 and $2500 per annum are practically the maximum salaries for rank and file men, and in the opinion of the Association this should be increased to $3000 at least.

It is estimated that to take care of this fixed promotion plan for men below $3000 an increase above the appropriations for the fiscal year beginning July 1, 1928, of approximately $115,000 will be needed for each of the first three or four years. After that time the men now receiving $2400 and $2500 per annum will have reached the $3000 per annum grade, and then the annual increase in appropriation will be small indeed.

If this plan be put in effect, a veterinarian entering the service on or after July 1, 1928, would in two years receive $2100 per annum and after eleven years of faithful service, as determined by his efficiency ratings given by his superiors, he would receive $3000 per annum.

Within a short time the Association will present to you for your consideration a showing of fact which, in our opinion, conclusively demonstrates that it is in the interest of efficient Government service, in the interest of the Veterinary profession as a whole, and a vital need to the men, that the veterinarians of the Bureau receive as soon as possible an increase which will put their salaries within hailing distance of the salaries paid other professional men in Government employ.

Thanking you for your kind consideration of our requests, with the hope that you will see your way clear to grant them so far as lies within your power, and that, you will advise us of your disposition of the matter, we remain,

Very respectfully,

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS.

Cotton seed poisoning is prone to occur in cattle that are fed a heavy ration of this feed for 90 days or longer. This malady is manifested by a reeling, unsteady gait, which may be due in part to muscular incoordina- and in part to blindness.

The control of black head in turkeys involves the prevention of infestation with cecal worms (Heterakis vesicularis) because the causative protozoon (Trichomonas meleagrides) is apparently associated with the ova of that parasite.

The larvae of the screw worm fly (Compsomyia macellaria) causes extensive losses of live stock in some sections of the country. Numerous experiments have been conducted to ascertain some effective method of preventing infestation, the most reliable screw worm repellent tested thus far contains 95 parts by volume of oil of tar, and five parts by volume beta-naphthol ether.

Saccharomyces farciminosus, the causative agent of epizootic lymphangitis, may be transmitted by direct contact, by the use of a common curry comb and brush, and by the common use of harness, saddles, etc. There is a possibility that flies may transmit this infection. However, this has not been positively demonstrated. The most successful treatment of epizootic lymphangitis is extirpation and cautery of the local lesions.

Viability of Ascaris Suum Ova Exposed to Weather Conditions

By H. B. RAFFENSPERGER, Zoological Division, Bureau of Animal Industry, Chicago, Ill.

THE question of the length of time that *Ascaris suum* ova will remain viable on top of the ground has become a very important problem in swine production. Many wooded permanent pastures, with a stream of water flowing through them, have been used for hog pastures for years and, with the increased demand for swine production, resulting in an increasing number of pigs kept on these pastures year after year, they have become so infected with parasite ova, especially at places where the pigs are fed and watered, that they are dangerous pastures for young pigs.

Many of these pastures are covered with trees and can not be cultivated, but are considered quite valuable pastures for pigs because of the shade and water. If it can be determined how long the ascarid ova will remain viable, the permanent pasture could be used for cattle and sheep until the ascarid ova were dead, when it would become safe to use it again for pigs. It could be worked in, with the crop-rotation plan, with other fields on the farm. In passing, it should be noted that a pasture heavily infected with the eggs of swine ascarids would not be entirely safe for sheep and cattle, since larval ascarids would pass through the lungs of these animals and are capable of causing severe pneumonias when many larvae are swallowed.

With the above facts in view, a series of experiments were conducted at Chicago to try to determine what effect weather conditions had on ascarid ova exposed on top of the ground. A suitable plat of ground south of the Army Building at 1749 West Pershing Road was set aside for this work. The first problem to work out was to develop a method for exposing the ascarid ova on top of the soil and then, after varying periods of time, to enable one to recover a sufficient number of ova to determine satisfactorily their longevity under such exposures to the weather.

Shallow, perforated tin pans were tried first as containers, but, when ascarid ova were mixed with hog feces and soil and then placed in the shallow tin pans, the dashing rains washed the material away. Earthen tile 12 inches long and 3 by 5 inches in width were next tried and these proved quite satisfactory. The tile were sunk ten inches into the ground and then filled with soil, which was packed in the tile to within 2.5 inches of the top and allowed to settle for several days before using. A large number of *Ascaris suum* ova were then spread over the top of the soil in the tile. The tile were covered with wire screens, to keep birds, field mice or rats from eating the exposed ova. Five of these tile were used in the first experiment.

The ova were obtained from gravid female ascarids (*Ascaris suum*) obtained at the packing houses. The worms were slit open and the two uteri exposed, and about two inches of the anterior portion of each uterus removed, chopped up by means of scissors and then ground in a mortar. To determine whether the ova in the ground material would develop embryos, a small portion of the material was placed in a petri-dish containing a two per cent formaldehyde solution and held in an incubator at a temperature of 22° to 25° C. Active embryos developed in the eggs. The remaining portions of this same material were spread over the top of the soil in the tile and exposed to the weather.

First Experiment

The exposure to the weather was made September 29, 1923. The first examination of the exposed material was made September 8, 1924, after 345 days' exposure. Some of the material was scraped from top of the soil in each tile. This material was placed in a beaker and tap water added, then screened through a 40- and an 80-mesh sieve and decanted until quite clear, and then the sediment was examined for ova.

Thirty-six ova were recovered and carefully examined under the microscope.

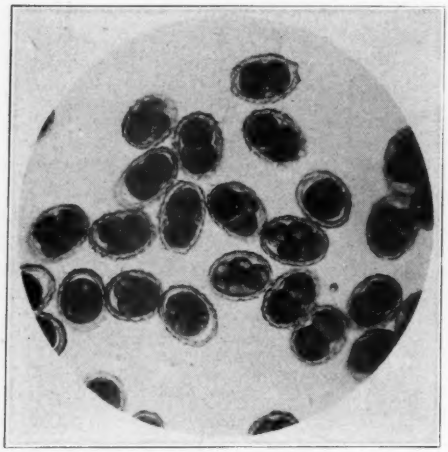

Fig. 1, showing cell division of ascarid ova in the process of development. In the various stages of cell divisions the ova are not infective until active embryos develop within the egg shell, the stage shown Fig. 2.

Of these ova 23 contained embryos, but no activity was observed, even though they were placed on a warm stage and observed from time to time for over an hour.

September 29, 1924, after 366 days' exposure, the remaining material was examined, using the same method for recovering the ova. This time, several ova were recovered, but only five showed developed embryos; of these five, two were active. The small number of ova recovered in this experiment was not very satisfactory.

Second Experiment

The method of preparing and obtaining the ascarid ova for this experiment was the same as in the previous experiment. Three tile were used this time and a large quantity of prepared material containing ova from the uteri of ascarids was spread over the top of the soil in the tile. The experiment was begun October 14, 1924. The observations on the ova exposed are covered in the following table:

Observations on ascarid ova exposed to weather—second experiment:

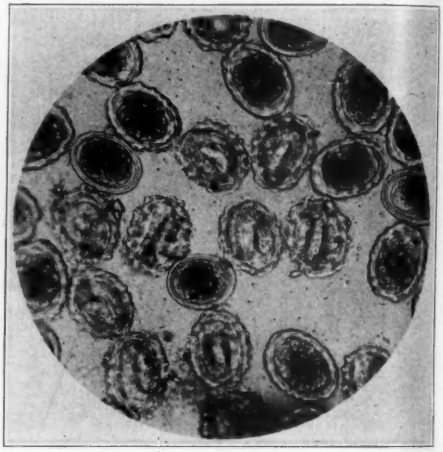

Fig. 2, showing vermiform embryos within the eggshell. In this stage of development the ova will infect when swallowed by a suitable host.

Date of observations.

March 27, 1925.

Length of time ova were exposed to weather.

164 days.

Findings on microscopic examinations of recovered ova.

Many ova recovered and examined microscopically. No cell division observed. The recovered ova were placed in a 2 per cent formaldehyde solution and held in incubator at a temperature of 22° to 25° C. Active embryos developed.

Date of observations.
April 17, 1925.
Length of time ova were exposed to weather.
185 days.
Findings on microscopic examinations of recovered ova.
More ova recovered and examined. No cell division observed. These were cultured as above and active embryos developed.

Date of observations.
May 18, 1925.
Length of time ova were exposed to weather.
216 days.
Findings on microscopic examinations of recovered ova.
More ova examined. A few showed cleavage, but not beyond 2 cells. Ova cultured as above, developing active embryos.

Date of observations.
June 2, 1925.
Length of time ova were exposed to weather.
231 days.
Findings on microscopic examinations of recovered ova.
More ova examined. Many had advanced to the morula stage. Ova cultured as above, developing active embryos.

Date of observations.
August 11, 1925.
Length of time ova were exposed to weather.
301 days.
Findings on microscopic examinations of recovered ova.
Recovered a large number of ova. Many contained active embryos. There were several observed, however, that were dead; at least they showed no activity and degenerative changes could be observed.
Date of observations.
October 13, 1925.
Length of time ova were exposed to weather.
364 days.
Findings on microscopic examinations of recovered ova.
Recovered a large number of ova; all the embryos were dead; these ova containing embryos were checked by holding the ova in a 2 per cent formaldehyde solution at a temperature of 22° to 25° C. for 6 days, then carefully examining them on the warm stage; no active embryos were observed.

Third Experiment

The method of preparing and obtaining ascarid ova was the same as in the previous experiments. Four tile were used and a large quantity of ascarid material containing ova was spread over the top of the soil in the tile. The experiment was begun April 1, 1925. The observations on the ova are covered in the following table:

Observations on ascarid ova exposed to weather—third experiment.

Date of observations.
September 12, 1925.
Length of time ova were exposed to the weather.
164 days.
Findings on microscopic examinations of recovered ova.
A large number of ova recovered and examined. Many contained embryos, but no activity was observed.

Date of observations.
October 19, 1925.
Length of time ova were exposed to the weather.
201 days.
Findings on microscopic examinations of recovered ova.
Many more ova recovered and examined. A large number contained embryos, but no activity was observed. A large number of these ova were placed in a 2 per cent formaldehyde solution and held at a temperature of 22° to

25° C. for 4 days, then a large number were examined, but no activity observed. The ova were subjected to heat from a warm electric stage, but no activity was observed.

November 18, 1925, more ova from same culture were examined; no activity observed.

Temperature record in degrees Fahrenheit at Chicago, Ill., for the period of exposure of the ascarid ova, according to the U. S. Weather Bureau.

Year	Month	Maximum Temp. F.	Minimum Temp. F.	Mean Temp. F.
1923	Sept. 29 to 30	68	60	64
	October	76	26	52
	November	62	44	46.5
	December	53	8	40
1924	January	48	–16	20
	February	44	10	29
	March	63	17	35
	April	76	23	49
	May	84	38	54
	June	94	48	64
	July	91	53	70
	August	92	58	71
	September	90	40	60
	October	81	40	60
	November	75	12	32
	December	56	–13	23
1925	January	44	5	26
	February	62	1	32
	March	76	–1	40
	April	86	34	53
	May	94	37	55
	June	96	51	72
	July	98	57	73
	August	96	57	74
	September	95	54	70
	Oct. 1 to 19	70	33	51.5

General Discussion of the Experiments

In the first experiment, begun in September, 1923, 36 ova were recovered at the end of 345 days, and 20 of these contained embryos that were dead; however, several ova were recovered at the end of 366 days, and 5 of these contained embryos of which 2 showed activity. While the number recovered is small, the survival of 2 eggs which were evidently alive indicates that some eggs, at least, may survive in soil as long as 1 year under climatic conditions prevailing at Chicago.

In the second experiment, ova exposed from October 14, 1924, to March 27, 1925, 164 days, and to April 17, 1925, 185 days, showed no cleavage, but when the recovered ova were placed in a 2 per cent formaldehyde solution and held at a temperature of 22° to 25° C., cleavage progressed and active embryos developed.

In the same experiment, ova recovered on May 18, 1925, at the end of 216 days' exposure, showed early cleavage in the formation of two cells. The recovered ova were held in an incubator and developed active embryos. On June 2, 1925, at the end of 231 days' exposure, many of the ova recovered had developed to the morula stage. It is of interest to note that, in this latitude, fertile ova exposed to prevailing weather conditions in mid October had not reached the infective stage of development on June 2 of the following year.

August 11, 1925, after 301 days' exposure, many of the ova recovered contained active embryos, while other embryos appeared to be dead. Just at what date the ova developed active embryos was not determined, but the findings indicate that, in this latitude, ova passed on the pasture in the fall (October) may not develop active embryos by June 2 of the following year, but may become infective during the summer. Just what might be concluded as to development by June 2 of eggs passed in manure in spring is uncertain, as the age of over-wintered eggs is doubtless coupled with decreased vitality.

It is also interesting to note that, after continuing the exposure of the ova that remained in the tile up to October 13, 1925, 365 days, or 1 year from the date of exposure in the fall of 1924, all embryos examined were found to be dead, when subjected to the usual test to determine activity and viability. The length of time of exposure apparently was not the sole determining factor, since some

eggs in the first experiment survived for a year. Other factors which would enter into the problem, aside from the simple time factor, would be extremes of high and low temperatures of varying duration, total periods of exposure to all unfavorable temperatures distinctly above and below the optimum range, variations in the way of high and low humidities, variations in acidity or alkalinity of environment, presence of bacteria, and other factors.

In connection with the moisture factor, the writer conducted several experiments in 1919 on desiccation of the ova. Ascarid ova in early cleavage stages were held for 31 days in an uncovered petri-dish at a temperature of 22° to 25° C. (71.6° to 77° F.) following which a 2 per cent formaldehyde solution was added to them and they were held for observation for 72 days and examined at different times; no embryos were observed at any time.

In the third experiment on exposure of ova to weather, the ova were exposed from April 1, 1925, to September 12, 1925, a period of 164 days, before attempting to recover any of them. At that time eggs containing dead embryos were found, but the lack of earlier examination precludes information as to the length of time the eggs were viable.

A common condition observed on many farms. The swine covered with mud, indicate a hog wallow is permitted or maintained on the premises. The small pig on the extreme left is a runt. Runts and unthriftiness are in many instances due to parasites. Hog wallows, ascarids and runty pigs are commonly found together.

Conclusions

In view of the highly variable factors already mentioned as involved in the problem of longevity of ascarid eggs, which factors can not be balanced in this experiment, little can be concluded from these experiments except the following rather obvious facts:

Of many ascarid eggs on soil at Chicago, Ill., for one year, from September 29, 1923, to September 29, 1924, a few eggs showed embryos, some of which were active, indicating the possibility of survival of some eggs for a year under existing climatic conditions. The conditions involved exposure to a maximum air temperature of 94° F. and a minimum air temperature of –16° F., the soil temperature not being ascertained.

Of ascarid eggs on soil at Chicago for one year, from October 14, 1924, to October 13, 1925, all eggs examined were found dead. Live eggs were found 301

days after exposure to weather conditions, but as no examinations were made between 301 and 365 days after exposure one can only say with certainty that the eggs were viable 10 months after exposure, that no viable eggs were found at the end of 12 months, and that the period of survival was somewhere between 10 and 12 months in this case and under these conditions. The conditions involved exposure to a maximum air temperature of 98° F. and a minimum air temperature of –13° F., the soil temperature not being ascertained.

A typical example of the effect of ascaris infestation of pigs. At four months of age badly infested pigs frequently weigh less than half as much as non-infested pigs of the same age, on the same kind of feed. Such pigs represent a loss to the swine raiser just as surely as pigs that die of hog cholera.

Of ascarid eggs on soil at Chicago for 164 days, from April 1, 1925, to September 12, 1925, all eggs examined were found dead, indicating that under the existing circumstances all eggs might perish in the course of from 5 to 6 months from spring to fall. The conditions involved exposure to a maximum air temperature of 98° F. and a minimum air temperature of 34° F., the soil temperature not being ascertained.

One might surmise that the higher maximum and mean temperatures recorded by the Weather Bureau for the summer of 1925, as compared with the summer of 1924, might have been partly responsible for the shorter life of the eggs in the last two experiments in 1925 as compared with the first experiment in 1924. Since high temperatures have a tendency to desiccate eggs, this explanation is reasonable and plausible, but the data are too inadequate to permit of a positive statement to this effect.

Any attempt to apply these findings to farm conditions must be made with caution. There are on the farm factors in the way of straw, manure, vegetation, humus, and other organic matter, bacteria, shade, moisture, and other things which complicate the picture. One can only generalize to the effect that on Illinois farms, with climatic and other conditions reasonably similar to those existing in these experiments, swine ascarid eggs might live so long as 10 months or a year, or might perish in the course of 5 to 6 months from spring to fall. One might also conclude that ascarid eggs passed on pasture in the fall (October) might be viable and yet not developed to the infective stage as late as June 2 of the following spring. It would not necessarily follow that eggs passed on the pasture in the spring, and not subject to the deleterious effects of aging and weathering over winter, would not be infective before June 2, or earlier dates, in Illinois or elsewhere.

Whipworms (Trichuris) of man and swine are according to Schwartz, morphologically indistinguishable. If the whipworm from man and swine are identical, then it becomes necessary to recognize swine as a source of infestation in the human.—Exp. Stat. Rec., Vol. 55, No. 8.

The sex ratio of pigs at the time of conception, according to Parkes, is males 150 and females 100. Males are less viable than females and the farrowing sex ratio is approximately males 55 and females forty-five. —Exp. Stat. Rec., Vol. 55, No. 7.

Inbreeding frequently reveals hidden characteristics. Thus, by the mating of a solid-color, pure-bred sow, to a boar that is a full brother, variegated colored pigs may be produced.

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Intravenous Injections of Vermifuges*

By M. FERNAN-NUNEZ, M. D., Vanderbilt University, Nashville, Tenn.

AN ATTEMPT was made to verify the feasibility of administering oil of chenopodium intravenously. Five dogs infected with Trichocephalus depressiusculus (the dog Trichocephalus) were given injections of chenopodium in dosage corresponding to their respective body weights. In each case the treatment rid them of Trichocephalus.

An opportunity was then afforded for trying chenopodium intravenously on the following patient, who volunteered for that purpose:

CASE 2.—A. de L., a youth, aged 19, was injected with 1.5 cc. of oil of chenopodium intravenously. Three hours later, and daily for seven days, he received 30 cc. of castor oil by mouth. He expelled 665 worms (table 2).

Table 2.—Results of Intravenous Administration of Chenopodium in Case 2

Day	Uncinaria	Lumbricoids	Oxyuris	Trichocephalus dispar
1	0	1	273	3
2	0	2	364	5
3	0	0	2	14
4	0	0	0	1
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
Total	0	3	639	23

CASE 3.—V. M., a man aged 22, was submitted to the same treatment as was used in the preceding case, with results as shown in table 3.

Table 3.—*Results of Intravenous Administration of Chenopodium in Case 3*

Day	Uncinaria	Lumbricoids	Oxyuris	Trichocephalus dispar
1	0	3	6	1
2	0	0	7	27
3	0	0	15	12
4	0	0	2	3
5	0	0	0	1
6	0	0	0	1
7	0	0	0	0
Total	0	3	30	45

After these trials, oil of chenopodium was administered by vein in eleven cases, with essentially the same results as in the two cases cited.

In susceptible patients, intravenous injections of any substance may produce attacks of syncope, with slowing of pulse, and at times vomiting and hiccup. Therefore, in intravenous injections of oil of chenopodium, one should observe the same precautions as in any other intravenous treatment. The urine should be examined for albumin, casts, pus and sugar; the heart should be examined for organic or functional disorders, and the hemoglobin should be estimated. The bowels should be open, and the patient not allowed to eat during the four hours preceding the injection; it is necessary that patients should rest in a horizontal position for several minutes before and for two hours after the injection. The use of a pure and fresh oil of chenopodium is indispensable.

Arsphenamines as Vermifuges

It was observed that patients with intestinal helminth or protozal infections unsuccessfully treated by routine measures often rapidly improved or recovered under arsphenamine treatment. Indeed, the intravenous injection of arsphenamines is now commonly used as an important adjuvant in the treatment of intestinal parasitism.

The routine intravenous use of the arsphenamines in the treatment of malaria in tropical practice gave me an opportunity to study their effect as a vermifuge in 200 selected patients, a number of whom showed infection with various parasites.

Table 4.—Effect of Arsphenamines on Intestinal Parasites

Parasite	Number of Patients	Patients Expelling Parasites	Patients Unaffected
Necator americanus	124	49	75
Strongyloides intestinalis	5	1	4
Ascaris lumbricoides	82	30	52
Oxyuris vermicularis	10	6	4
Trichocephalus dispar	81	34	47

An ounce of magnesium sulphate was given two hours following the injection.

While a considerable percentage of arsphenaminized persons expelled a few or many worms, in a large number of cases not all the parasites were eliminated. The

* Excerpts from an article in Journal of the American Medical Association, March 19, 1927.

arsphenamines employed intravenously would thus seem to have a limited but useful application as vermifuges, aside from their great value in combating the anemia consequent on all cases of intestinal parasitism.

Trichocephalus Vaccine

The success of medication through the intravenous route led me to consider the preparation of a vaccine against Trichocephalus.

Deducing that the eggs of Trichocephalus consisted largely of an albuminous principle of embryonal character, with a formula simpler in construction than the egg proteins of animals higher in the phylogenic scale, I attempted to obtain an extract of such embryonic proteins by the method devised by Carracido for the isolation of protamines:

Some females of Trichocephalus depressiusculus were cleansed in physiologic sodium chloride solution; the posterior third of the body, containing the uterus and eggs, was ground in a mortar with sand, and extracted as follows:

To approximately each gram of the mass 30 cc. of 96 per cent alcohol was added, and the mixture was boiled for five minutes, and filtered. The mass was next extracted with ether, and filtered. The cholesterol, lecithins and fats being thus removed, and the protamines precipitated, the residue was extracted with tenth-normal hydrochloric acid (60 cc. for each gram or less of the mass), filtered, and the filtrate carefully neutralized with 5 per cent sodium acetate solution, phenolphthalein being used as an indicator.

Table 5.—Injections of Protamic Extract in Dogs

Number of Dog	Day of the Injections 1	3	5	7	9	12	15	18	21	24	27	30	32
1	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7
2	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8
3	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9
4	0.4	0.5	0.6	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0
5	Control												
6	Control												

A dog infected with Trichocephalus was given an intravenous injection of 1 cc. of the protaminic extract. The animal suffered a convulsive attack, but recovered within thirty minutes. The toxic action probably resulted from the protones contained in the vaccine, which originated from a slight hydrolysis of the protamines by the acid employed in the extraction, and because the dose was excessive.

Six dogs were submitted to intravenous injections of chenopodium to cleanse them of Trichocephalus. They were then placed in individual cages, and each was given a series of injections of the protaminic extract, in smaller dosage than that employed in the dog mentioned, as indicated in table 5.

At the end of the thirty-two days all the dogs were in good health, with the exception of dog 4, whose blood examination showed a slight anemia, produced perhaps by the higher dosage of vaccine administered.

For five successive days each dog was given food containing eggs of Trichocephalus depressiusculus. These eggs had been kept in water for more than a month in order to permit development of the embryos, essential with Trichocephalus.

The dogs were kept isolated in their cages and their feces were examined at intervals of three months.

Table 6.—Result of Examination of Feces in Isolated Dogs

Dog 1	negative for ova at end of 90 days
Dog 2	negative for ova at end of 90 days
Dog 3	negative for ova at end of 90 days
Dog 4	negative for ova at end of 90 days
Dog 5	positive for ova at end of 36 days
Dog 6	positive for ova at end of 41 days

Dogs 1 and 2 were then freed to associate with dogs of the street, which almost invariably carry Trichocephalus.

Dogs 3 and 4, remaining in isolation, received subcutaneous injections of eggs of Trichocephalus depressiusculus for three injections. My previous trials of subcutaneous injections of Trichocephalus eggs in nonimmunized and noninfected dogs had demonstrated that intestinal infection could occur by that route.

The feces of all the dogs were examined from time to time over a period of three additional months. Dogs 5 and 6 (the controls) were the only ones found to be infected at the end of that time.

The two dogs remaining in captivity were now set free. The seventh month after the immunizations dog 2, and the eighth month dog 1, presented Trichocephalus eggs in the feces. Dogs 3 and 4 did not show eggs for a period of approximately a

year, when dog 4 was killed by an accident and dog 3 disappeared.

Evidently the extract of eggs of Trichocephalus depressiusculus had produced an immunity against reinfestation, lasting almost seven months in one dog, eight months in another, and an indefinite time in two others, because the nonimmunized dogs acquired the infection immediately after being set free.

The results thus obtained with helminthic vaccination apparently are of very limited possibility in human vaccination, because of the great difficulty of application and because sanitary measures against infestation are more practical. However, if such a vaccine could be worked out for the hookworm and applied by a simplified technic, it would have a limited field of utility in tropical practice. There is a possibility for the practical use of a trichocephalus vaccine among dogs and other animals.

Conclusions

1. As Trichocephalus dispar and Oxyuris vermicularis tend to localize in the appendix and cecum, oral treatment often fails to reach them.

2. Carbon tetrachlorid is not efficacious against Trichocephalus or Oxyuris, although it is fairly useful against the strongyloides family.

3. "Leche de higueron" by mouth is efficacious against Trichocephalus dispar.

4. Oil of chenopodium is the most satisfactory of the common vermifuges against Trichocephalae and Oxyuris.

5. Oil of chenopodium by mouth, administered in a single dose of 40 minims, followed immediately by an ounce of castor oil, is equally efficient, less dangerous, and much more convenient for patient and physician than the more commonly used method of divided doses.

6. Oil of chenopodium by intramuscular or intravenous injection is specific against Trichocephalus and Oxyuris, the two most difficult nematodes to eliminate.

7. Arsphenamines given intravenously will often expel intestinal nematodes, but their field as vermifuges is very limited.

8. Extracts of eggs of Trichocephalus injected into dogs at three-day intervals for one month apparently conferred an immunity against trichocephaline reinfestation for periods varying from seven to twelve months.

9. While a Trichocephalus vaccine has only a limited application in man, its possibilities in veterinary practice are worthy of careful consideration.

10. The success of a vaccine against Trichocephalus may serve as a basis for the production of vaccines against other helminths.

The action of ether, chloroform, ethylene and propylene on animals and animal tissues has been known for some time, and their value recognized. Plant physiologists now announce that plants, seeds, bulbs and cuttings can be awakened from their dormant stage by these chemic substances and it has been found possible to ripen fruit that is only three-fourths grown, in a day or two.

In one year, hunters who patrol the ranges and protect the herds and flocks of horses, cattle, sheep, goats and swine, disposed of over 80,000 stock-killing predatory animals, including 114 bears, 173 mountain lions, 687 timber wolves, 2,827 bob cats and Canadian lynxes, and 77,185 coyotes. It has been estimated that over $35,000,000.00 worth of live stock has been saved during the last seven years as a result of predatory animal destruction.

The death (prenatal) of pigs in utero is relatively large if the corpora luteum is a reliable guide. Thus, F. A. E. Crew reports that in 27 parturient sows, the average number of pigs was 7.9, but the average corpora luteum number was 13. In other words, an average of 5.1 pigs perished between the time of conception and farrowing. This represents a loss of approximately forty per cent. The cause of this heavy prenatal loss has not been attributed to any one factor, but pasture, breeding and diseased reproductive organs are probably the most important etiologic factors.—Exp. Stat. Rec., Vol 55, No. 8.

A Few Remarks on Infectious Diseases*

GEO. COLLINS, West Point, Nebr.

ALL OF YOU have seen shot-gun prescriptions and you will now hear a shot-gun paper. The object being to make us all do a little more thinking. This paper was written from a Practitioner's standpoint, and is intended for the Practitioner.

Have taken for my subject, agencies which lower the vitality; weather changes, sanitation, parasites, food, vaccination, etc., which predispose animals to infectious disease. In other words, agencies which decrease the body resistance thus increasing the susceptibility to some infectious diseases. The following conclusions are based on my own observations.

The first infectious disease we will consider is hemorrhagic septicemia, caused by a bi-polar organism, which is usually pathogenic only in predisposed animals. I believe that most of us agree that climatic changes, malnutrition due to an unbalanced ration or a sudden change of foods are the most important predisposing causes of this disease in animals. Immunization in swine against hog cholera is another important predisposing cause to hemorrhagic septicemia. These facts are common knowledge to practitioners and it is their duty to inform their clients. It is a duty of the veterinarian to inform his clients of the injurious effects of bad housing, poor sanitation, the danger of unbalanced rations, or the sudden change of feeds.

A real service could be given our clients by instructing them in the necessity of the proper preparation of a car, bedding, stripping to prevent draughts, disinfection, etc., for the shipping of stock hogs. Suggestions regarding the necessity of removing shipped in cattle, sheep or hogs from the stockyards promptly will be appreciated, as well as proper feeding and housing on arrival at destination.

The mortality of cattle which have contracted the disease during shipping or shortly after arrival can be reduced to a minimum by proper housing, medication which is so often thoughtlessly neglected, blanketing, and a suitable ration during convalescence.

If a veterinarian would only do a little more on some of these apparently small things, he would have more recoveries, his client would profit financially and would not begrudge the money spent on treatment. The tendency among veterinarians in this state today is to become serum squirters, forgetting and neglecting other important phases of veterinary work. Some veterinarians, not practitioners, are everlastingly harping on major operations, this makes a real practitioner tired. Any veterinarian with a thimble full of brains knows that he earns his livelihood out of the minor operations and other minor work. The income from a year's major operations would not feed and pay a veterinarian's expense for 30 days. Then why neglect the very things that earn us a livelihood.

In fowl cholera, a little prophylactic thinking before the dispensation of the remedy and a little subsequent thinking on disinfection will, usually, save many more birds, and make our client a more regular office visitor.

Intestinal parasites particularly of young chickens predisposes them to fowl cholera. Many flocks have been successfully treated after the use of a reliable vermifuge.

You may say that I failed in diagnosis, that the disease was verminous enteritis. This is not the case, for I made no diagnosis —only inquiries. My clients came for fowl cholera medicine, which I gave them. Later, they returned and apprised me of the fact that my medicine was no good. This doesn't perturb me in the least, for I have been in the game too long. I expect it as a matter of fact.

* Read at the annual meeting of the Nebraska Veterinary Medical Association, Lincoln, December, 1926.

Roup

They say there are two kinds of roup, one caused by a specific infection and the other due to malnutrition. I have never been able to recognize but one, and until more evidence has been secured than we have today on the subject, I shall continue to believe it a specific infectious disease caused by a specific organism and favored by climatic changes, poor sanitation or malnutrition and other conditions that lower the resistance of the bird,

A few questions I might ask. Why are the external lesions of roup usually manifested unilaterally? Why not bilaterally? As a matter of fact, are not the objective symptoms of nutritional diseases manifested bilaterally? If roup be a nutritional disease, why doesn't a corrected diet invariably check its spread? Why use sanitation, medicines and disinfection to check its progress and ravages?

However, I believe malnutrition is a predisposing factor and should be corrected—and to treat roup successfully, isolation, sanitation, medication or vaccination and disinfection should be resorted to.

Some will say, no causative organism has been isolated—it may be due to a filterable virus. It has not been transmitted experimentally. Perhaps they did not have the predisposing factor. All chickens in a flock do not get the roup. However, they share the same house, same yards and the same ration—explain it if you can? Sometimes it spreads very slowly—mortality low. Other times it spreads rapidly and seems very virulent—if we dare use the word—and the mortality high. And occasionally, only one or two birds in a flock will have it. Roup occurs in the poor rationed and in the well rationed flocks.

These statements are made and these questions asked for the purpose of stirring up sufficient enthusiasm so that in the near future, some one may ascertain the etiological factor of roup.

Sometimes we do not understand all we know about a thing, again, sometimes we do not understand all that is understood.

Necrotic Enteritis in Swine

This is another disease due to predisposing factors, namely, malnutrition, poor sanitation, intestinal parasites and sometimes cholera immunization. Until this is realized and corrected, necrotic enteritis will make the swine industry a lot of trouble.

Prevent malnutrition in pigs by feeding the sow a proper ration and a sufficient quantity to prevent emaciation of the sow until the pigs are weaned. Emaciated sows mean injured pigs. It costs no more to prevent emaciation of the sow than to put an emaciated sow on the market in prime condition and the pigs' vitality is not reduced. Feed pigs milk or make a slop out of ground grains just as soon as the pigs are old enough to eat. Mixed grain diet and tankage in the proper proportions is best for pigs. A good mineral mixture, one part, and tankage, two parts, in a self feeder is good for pigs. Everyone knows that the sow and pigs should have access to a good pasture. All of you have seen the sow and pigs and even calves, housed in a dirty, damp pen, where the sun's rays never penetrate. Such housing should be condemned whether the owner likes it or not and such advice is a favor and a good deed toward the small helpless animals and the owner will profit therefrom.

The need for sanitary barns and premises should not be overlooked.

Intestinal parasites cause more grief to the swine industry than any other one thing, and are ignored the most. They lower the pigs' vitality thus making them extremely susceptible to necrotic enteritis. As the pigs become infested early in life, they should be wormed early—when six to eight weeks old.

After weaning, pigs should be given a sloppy or soaked grain diet for at least 30 days and let run in a good pasture. This particularly applies to pigs on infected premises.

Necrotic enteritis, when present in a herd at time of immunization, should be taken into consideration and treated—the whole herd should be given a preventative treatment—and a diet prescribed. In other words, take care of the pigs until they weigh ap-

proximately 100 pounds, thereafter, they will usually take care of themselves, if given an opportunity.

Flu in Swine

This is a contagious, infectious bronchitis or a broncho-pneumonia of swine. No doubt, a specific disease caused by a specific infection. This disease follows closely severe climatic changes during the fall months. Whether an all corn diet has anything to do with the decreased resistance to the infection, is a question. I know of no way to prevent the extreme climatic changes, so know of no way to prevent flu in hogs. It is almost impossible to handle a herd of hogs just right at this time of year.

Hogs affected with flu should have comfortable quarters, well ventilated, well bedded and no draughts and a small yard in which to exercise and feed. If the farmer will not do this, ask him if he had three or four children who had bronchitis or pneumonia, would he let them sleep in an open yard, around a straw-pile or let them run in a cornfield. This will usually make them do a little thinking and you will not have much trouble in having the hogs cared for. The hog-barn and a small yard is the proper place for a flu hog. The soaked-oats diet, plus a small quantity of sodium chlorid and sodium sulphate, and some corn is better than all corn. Don't be in any hurry to let hogs roam—keep them in close quarters for at least one week after an attack of flu.

International News Reel Photo

Dogs being vaccinated for the prevention of rabies by Dr. Phineas Bridge, Upper Montclair, N. J.

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Selection and Housing of Breeding Stock

By F. D. PATTERSON, JR., Auburn, Ala.
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IN DEALING with baby chick disorders, we as a rule, too frequently make a diagnosis of some specific infectious disease, losing sight of the fact that errors in management are so often at the root of the evil, such as chilling, overheating, overcrowding, bad feeding, feeding too early, improper incubation and brooding, and often our trouble traces back even as far as faulty or weak parentage. These, and many other factors are of prime importance in disease control work, often playing a prominent role in specific infectious diseases. For these reasons, I have decided to begin this series of articles by discussing these important points.

Breeding Stock (Eugenics)

Too much stress can not be laid on proper breeding stock for chicks hatched from weak parentage come into the world handicapped, and are naturally more susceptible to disease, either specific or nonspecific, for eggs capable of possessing the qualities of high hatchability and of producing strong livable chicks, can not be produced from constitutionally weak parentage.

In selecting breeding birds, the following points should be borne in mind:

Select male birds (and remember the male is one-half the entire pen) that present masculine traits to a marked degree. They should have a broad, well proportioned head, strong well curved medium length beak, rather large, bright alert eye, bright red face, comb and wattles; comb should be well developed, strong and firm; skull broad, entire head and adjuncts should denote strength and vigor. Neck broad, well arched, for his breed, and blending well into shoulders. Shoulders broad and strong; back broad, and of moderate length for his breed. The entire top line from shoulders to tail should be broad and of nearly equal width throughout. Body broad, deep, full. Breast, broad and deep, well muscled. Wings strong, tightly folded; wing feathers held up with no tendency to drop down. Legs should be set well apart, strong, moderate length, and good, well developed bone for his breed; legs should be straight and denote strength. Tailed, carried well up, and in a stylish manner, breed being considered. Taken as a whole the male should impress one as being strong, vigorous, alert, active and attentive to the females. Of course breed must be considered as we can not compare a small active bird in this respect, to a large plethoric one. Here a knowledge of breeds is essential or we may go wrong in our selection. Avoid males which show the following constitutional weaknesses:

Never consider one lacking in masculine qualities. One that is not attentive to the opposite sex. Avoid any male which impresses you as lacking alertness, vigor, vim, etc. As a rule the best fighters for their breed are the most vigorous and is a good test for constitutional strength. Studiously avoid a bird with knock knees, or the opposite, turning out at hock. The term knock-kneed is really applied to turning in at the hock joints. Either of the above denotes weakness to a marked extent. Birds should not be used that show, as the poultryman terms it, too much daylight—birds that are too leggy or have a breast too highly carried or breast that is sunken as though he had been kicked in the breast. Narrow shallow breast are to be avoided. Birds are generally weak if their wings naturally hang down, loose, often spoken of as a

slipped wing, as weakness is usually the cause of his not carrying wings properly folded. Of course in some instances, it may be due to injury or causes other than weakness. Narrow headed birds, peaked headed, narrow, straight beaks, or beaks that show an abnormal amount of curve, heads that are pinched just in front of beak, should always exclude the male from a breeding pen. Birds lacking in bone development are to be discarded. We generally find that birds of whatever breed that approaches the standard weight, are the best size to select. Never allow birds much under weight, in the pen. Backs which are narrow or which are wedge shaped, that is, become very narrow in saddle region which is near tail, should never be used. Some breeds are naturally short bodied, but usually make up for it in depth and breadth. Some are naturally leggy and some have their standards patterned on freakish lines. These things should be taken into account, when selecting birds. The latter breeds requiring freakish standards should be discarded as a breed, and some breed used where standard requirements are more in keeping with good constitutional vigor. The illustrations herewith are good examples of correct and incorrect types to use.

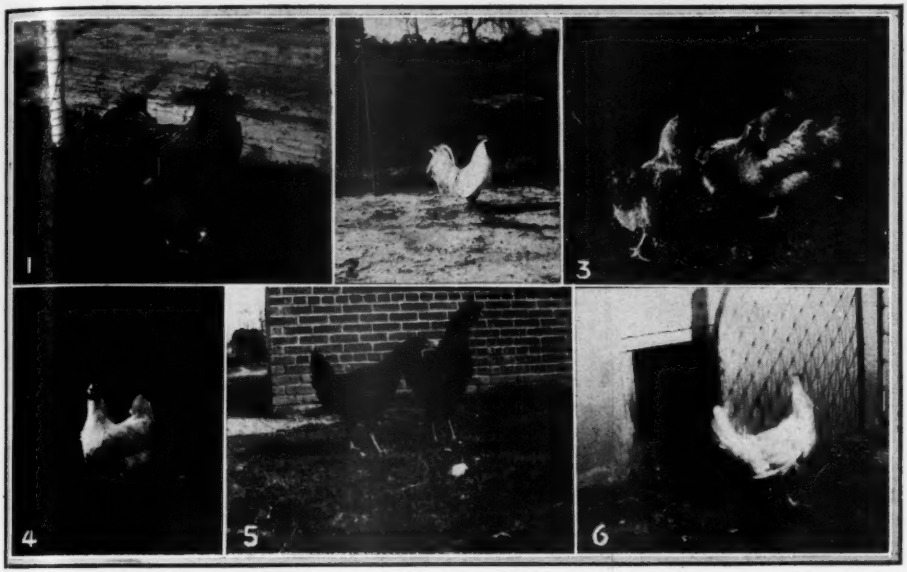
In selecting females, the same general lines are to be followed with a few special features here considered. The female should possess marked feminine qualities. We all know that the pullets from males denoting marked masculinity are more feminine than those from other type males, and feminine type females produce most marked masculine type males. Hens should have an especially broad, deep body and back; ample digestive capacity; abdomen soft, pliable; vent moist, wide between pelvic bones; wide between legs; rather large combs; back rather long. Length, breadth and depth of back, and body, and breadth and depth of breast with good width between pelvic bones. are the essential points in good producing hens. Head, etc., should present same general points as males except should be of pronounced feminine character. Females, much under standard weight or size, should be excluded, though the smaller birds, especially in middle and heavy weight breeds, often, or in fact, generally make the best layers. Females, much over-sized should also be excluded. In size, those approaching their respective breed standard weights, are to be preferred. With such stock properly cared for we may rest assured that we will get a maximum amount of fertility, and viability of offspring. Of course we occasionally find birds whose external appearance indicates all desirable qualities, still they will fail in the final test as they sometimes fall short as to fertility and in producing strong germ cells. Such cases, however, are rare and can only be determined by a test in the breeding pen. Some breeds are more prone to these traits than others. In summarizing briefly the following three points are the cardinal ones in selecting breeding birds:

1. Breeding.
2. Individuality.
3. Prepotency.

We must also bear in mind the many hazards met with in indiscriminate inbreeding; whereas, on the other hand constructive line breeding is productive of much good in moulding valuable points into a flock. The average poultry breeder should, however, leave this to the experienced, well-trained man along these lines and depend upon him for his fresh blood, going back to a breeder who breeds the same strain of birds for the crossing of strains of same breed and variety that as the poultrymen term it, do not "nick," in many instances, tears down what the constructive breeder has spent years to produce. The crossing of strains should therefore, when desirable, be carried out in a small way so if the strains do not nick the progeny of only a few birds is lost. If the cross is beneficial then this new blood, the progeny of the crossed strains, can, with safety, be infused throughout the entire flock. In referring here to crossing strains, we do not mean cross breeding of different

breeds or varieties, but the crossing of different strains of the same variety, as the crossing of S. C. White leghorns of, say, Tancred strain with those of Young's strain. This is spoken of as out-breeding while the breeding of two different breeds

scribed, and the other is because we lose the value of the breeder's long years' of experience in mating birds. It is best to select a good, reliable breeder from whom to purchase breeding stock. Tell him what you want and let him select and



1. Single Comb, Buff Orpington, cockerel, general purpose type, English class, representing correct type to select in breeding for constitutional vigor. Property Ala. Exp. Sta. 2. An excellent single comb White Leghorn, representing egg type, Mediterranean class, proper type to select. He was tired when snapped, which accounts for inclination of wings to drop. Property Ala. Exp. Sta. 3. Group of excellent single comb Buff Orpingtons, English class, representing proper type to select for breeders of this type of bird. Property Ala. Exp. Sta. 4. White Wyandotte, American class, middle weight breed, in Alabama egg laying contest. Good breeding specimen. This breed is naturally short bodied. 5. Single comb, Rhode Island Red cockerels, same age, fed and cared for in same manner. For past two months have been on deficient diet. In spite of this fact, one on right still shows original constitutional vigor. Note contrast of one on left. Property Ala. State Vet. Dept. 6. Single comb White Leghorn hen, representing poor constitutional type egg laying contest entry. Property Ala. Exp. Sta.

or varieties is cross breeding. The latter is to be discouraged as much as possible except experimentally and in producing new breeds as it leads only to mongrelism. It sometimes becomes necessary in line bred flocks to cross strains (outbred) when we find a defect becoming too common or firmly rooted in our flock and it should be done as described. It is usually a mistake to advise clients to buy male and females from different sources for two reasons. One has already been de-

mate them for you. He will have many pens, so can select birds that are of the same strain, yet not closely related. It is customary to breed mature males (Cocks) to pullets, and well grown cockerals to hens. Never breed from immature stock. Birds under one year old, should generally not be used as breeders. Birds in their second year, while not so productive, are better, for two reasons: 1. They are mature; 2. They have passed through one breeding season so we have

a very good idea as to their prepotency, especially is this true of the female. Young, vigorous, well-matured males, mated to good hens in their second year are generally our best bet. Of course we have no record on such males if in their first year, as to prepotency, but if they are good individuals and have good breeding back of them, we can feel safe in using them and will seldom go wrong when we do.

Fig. 7. Poultry house on the Alabama Experiment Station farm housing two contest entries. This house is practically all cement including the floor. The inside fixtures are of wood. The house faces South. It is not open enough, is too expensive for ordinary use and cannot be moved.

As to number of females to breeding pen, of the light breeds, one male to twelve or fifteen hens is about correct. Of the middle and heavy weight breeds, one male to every eight females. It is best to use only one male to a pen.

Care of Breeding Stock

Now that we have selected our breeding birds, the next question is proper care; for no matter how accurately and carefully we have selected and mated our birds, good care must be given them if we expect them to produce strong healthy chicks. The first essential is selecting a proper site for the breeding house and yards. These should be located on a well-drained soil, a sandy porous soil is best suited for this, and if possible select a place that has a gentle slope to it, for all this favors drainage which is very important from a standpoint of sanitation, for if we are fortunate in having such a location, nature will materially aid us in our sanitary work, and we will not have so much artificial drainage to do. If possible select a place that has some shade trees already growing. If not plant some at once, and provide artificial shade until trees supply it. Do not have too much shade, however, for it is an all important factor that sunlight be plentiful and the soil freely exposed to its direct rays, as that is one of our most important sanitary assets.

The next point is house construction. The location should be on an elevated area, never at a low point where bad drainage conditions exist and the soil remains damp and sour. In constructing the house the following few essential simple points should be kept in mind:

A good house is not necessarily an expensive structure by any means. Very efficient houses for small flocks can be constructed from piano boxes or waste lumber, provided the essential points are maintained. The houses should be roomy, at least four square feet of house room should be provided for each bird. The north, east, and west sides should be tightly walled up so that no draft can blow on birds. The south side should be almost completely left open and wire netting used over this end. Houses, of course, should always face the south. On the south end a six inch board above and below is usually sufficient, as far as solid material is concerned, especially for birds of middle and heavy breeds. Light breeds with large combs, as single comb leghorns and minorcas require more protection than the heavy ones, because of their comb development which often becomes frozen in extremely cold weather. There are, however, few nights cold enough for this in the south. The latter type also are usually more lightly feathered and most of them, as the Mediterranean class originated in hot climates. These facts make them more susceptible to cold. It is, as a rule, a good plan to provide the

south end with a muslin curtain which can be lowered or raised at will. We, in this section, however, seldom need this protection, but it is convenient in emergencies. It is also a good plan to have wide hinged doors which extend throughout the depth of house, for in hot weather these can be elevated to marked advantage as all that is necessary in summer months in protection from rain.

The roof should be water tight to insure dryness, for leaky roofs are often very damaging to the occupants of the house.

Floors can be efficiently made of: 1, cement; 2, wood; 3, dirt. Cement floors are excellent as they can be easily cleaned and disinfected, but are costly and can not easily be moved which is a very serious handicap for it is essential that our houses be moved to fresh grounds occasionally to keep down yard contamination. Such material, however, is good for large, heavy permanent houses, though such houses are inferior to small unit movable houses from a health standpoint, for fresh ground is of prime importance to health and a fact which has heretofore been much neglected.

Wood floors are perhaps the most practical for general use for they are comparatively inexpensive and can be placed in a movable house. Board floors should be constructed of smooth, tight fitting boards, no cracks being allowed. This facilitates cleaning and prevents drafts coming up through the floor. Floors of this type should be elevated from ground.

Dirt floors are cheap and often satisfactory. They should be elevated to insure against surface water from outside, and should be made with a foundation of some hard earth or cinders, coarse sand covering top. The defects of such a floor are difficulty in disinfecting and keeping clean of dust and other material and they provide good places for insects, as fleas, to breed.

The interior walls should be of smooth, well fitting material, as this eliminates drafts, and facilitates cleaning and disinfection. Cracks should be at a minimum for they harbor such parasites as mites and fleas and makes it harder to get at these parasites with a paraciticide.

Dropping boards should be in rear of house and made of smooth tight fitting material, set low to floor to prevent birds, especially heavy breeds from bruising their feet when coming off roost. Perch poles should be placed about four inches above dropping boards; they should be all of same height or birds will all try to crowd on highest perch. They should have ample room between them and be of sufficient number to insure plenty of room without forcing birds to crowd themselves. Perch poles should be removable

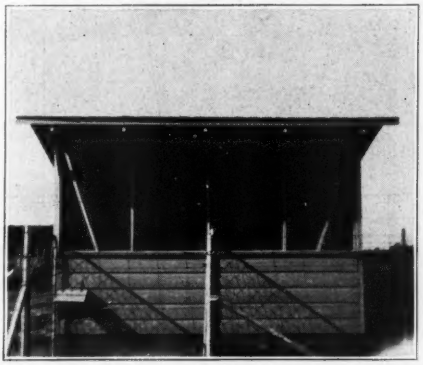


Fig. 8. A better house than No. 7. It is all wood, smooth material, open enough and can be moved. This excellent type of open or nearly open front house is used on the Alabama Experiment Station farm for housing two pens of chickens. It faces South and is very satisfactory.

to facilitate thorough cleaning and disinfection. They should also be on a hinged frame so they can be elevated when cleaning dropping boards. Nest boxes should be roomy, built of smooth material and are best placed under dropping boards to economize in space. Six nests for a pen of eight to twelve females is sufficient. Trap nests are generally used on well regulated poultry farms, so that accurate records can be kept. Food hoppers and drinking vessels are usually best kept in the house, elevated off the floor sufficient to prevent litter and dirt being thrown into them. Chickens readily learn to fly

upon a platform when they wish to eat mash. Water should be as conveniently placed as possible so as to encourage fowls to drink freely of it. Both hoppers and drinking vessels should be constructed so as to keep them from becoming contaminated by the fowls getting their feet in them. The floor should be

Fig. 9. Poultry house used by a Veterinary student at the Alabama Polytechnic Institute for housing breeders. It is a little too open, being open on both South and East sides. It should be open only on the South. It has a dirt floor and is a little too narrow. However, it is better than the average and much better than the closed type of poultry house. In spite of its faults it has given good results.

well littered with straw as wheat, oat straw, or oak leaves. Pine straw can be used where it is available and other materials are not easily obtainable. There are two reasons for this litter. 1. To provide a place to throw grain feed to insure exercise. 2. To provide a soft place for the birds to land when jumping from the roost and to walk on, which prevents bruising of feet and bumblefoot. Houses should be frequently cleaned and sprayed with some good disinfectant.

Yarding

Here in the south our yards are used practically every day in the year, it very seldom being necessary to confine birds to houses. Hot summer weather when shady yards are not present, necessitates confinement to houses far more often than cold, rainy days. This confinement being necessary only where no shade is provided in runs and then only during the hottest part of the day. Yards should be as roomy as practical for the more room the better. A yard 14x60 makes a very efficient size, but this should be the minimum when space is available. Of course, smaller runs are sometimes successfully used, but this is about as small as we should figure on using for a pen of eight to sixteen birds. Two such yards should always be provided to give necessary yard rest. One yard should be growing some green food as rape, rye, oats, etc., while the other is being used. As soon as green crop is mature enough to pasture, turn birds in and plant the other yard from which birds have just been removed. This not only keeps the yards sweet, clean, and fresh, but provides valuable green food in the most economical and efficient way from every standpoint. Never forget to provide ample

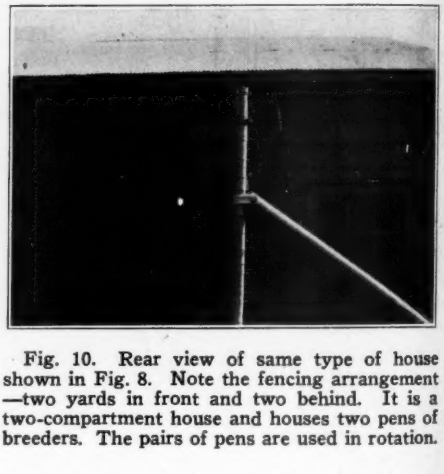


Fig. 10. Rear view of same type of house shown in Fig. 8. Note the fencing arrangement —two yards in front and two behind. It is a two-compartment house and houses two pens of breeders. The pairs of pens are used in rotation.

shade trees and observe strict cleanliness, never less than two runs to a pen should be considered, and better three especially where moving of houses is not practical as in the case of large unit system houses and scarcity of space exist.

The subject matter in this article may seem far removed from baby chick troubles, but nevertheless they are a very

vital factor in producing chick troubles and I have attempted to start at the very beginning of many of our troubles. The

Fig. 11. An insanitary poultry yard. The stagnant water indicates poor drainage at this point. Note the birds about the pool—a fertile place for the propagation of disease. Germ contamination and parasite infestation is favored and invited by this type of yard.

illustrations used are not as well suited as I would like for them to be, but are the best I can get at present.

(To be continued)

ESCHAROTICS

A year or more ago, there appeared in VETERINARY MEDICINE, an article on the subject of exuberant granulation, together with a prescription for an application. This prescription proved very satisfactory and would stop the itching in all cases, so that the animal had no further desire to gnaw or bite the wound.

I have looked over my files, but I cannot locate this article, and as I have a case tied up short right now, I will appreciate your giving the prescription again.—J. K., N. C.

Reply: All of the following prescriptions for caustic applications have appeared in VETERINARY MEDICINE:

Cancer Paste

Arsenic,
Sulphur,
Zinc sulphate,
Rochelle salts.

Of each equal parts; add the yolk of one egg, until the consistence of paste; bake with slow heat until dry, and then pulverize. When desired for use mix again with egg, and apply as paste or on cloth.

Cancer Paste

Zinc chlor.
Aluminis pulv. aa.....gr. v
Acid tannici .....gr. ii
Ferri persulphatis .....gr. iii
Glycerin, sufficient quantity for paste.
Mix. Apply as paste or plaster.

Caustic For Fistula of the Withers

Mercuric chlorid .....℥ i
Hydrochloric acid .....℥ i
Alcohol .....℥ vii

The tract is first irrigated with a one per cent solution of formalin and then injected with the liquid caustic. The skin must be anointed with vaselin to prevent irritation from the overflow.

Caustic Paste

Zinc chlorid
Powdered hydrastis
Powdered ulmas
Powdered gum acacia
Powdered ginger aa equal parts
Water q. s. to make a putty-like paste.

Sig. Apply with a spatula, cover over with cotton and hold the cotton in place by pasting its circumference down with collodion. This dressing prevents exudates from over-running the surrounding skin and may require renewal each day during the exudative period.

Dynamite Packing for Fistulous Withers

Zinc chlorid .....℥ iv
Gum arabic .....℥ i
Powdered sanguinaria .....℥ iv
Water .....℥ i

Escharotic For Malignant Tumors

Sanguinaria pulv. .....1 part
Galangal pulv. .....3 parts
Chlorid of zinc.....q. s.
Mix.

Paste For Removing Skin Tumors

℞
Zinci chloridi.....ʒ i
Pulveris amyli .....ʒ ii
Cocainae hydrochloridi .....ʒ ss
Aquae .....ʒ ii
M.
S. Apply externally.

Stronger pastes spread on gauze or packed in cavities and left 2 or 3 days are used to remove cancer, as follows:

℞
Zinci chloridi
Pulveris amyli .....aa ʒ iii
Pulveris acaciae
Aquae .....aa ʒ i
M.
S. Apply externally.

Caustic Solution

Zinc chlorid .....℥ i
Water .....℥ i
M. et. f. sol.

Sig. For strong astringent action, touch the surface lightly with the solution. To cause a slough, apply on gauze as a wet dressing.

Poisonous Plants

By DR. L. H. PAMMEL, Iowa State College, Ames, Iowa

I AM very glad to accept this invitation to talk to you on the subject of Poisonous Plants. I also want to thank your president for so kindly introducing me. I have been interested in poisonous plants and in veterinarians for a great many years. I have had contact with veterinary students for about 38 years. I have met a good many students and veterinarians in Florida on this trip. It is a pleasure for me to acknowledge the courtesy shown me by Dr. Gillis, Dr. Sanders, and Dr. Shealy, and to commend the fine work done in the interests of veterinary science.

It was my pleasure to make a collection of a few poisonous plants. This is a big subject. I do not know that we realize the damage that poisonous plants do to the livestock industry of the country, but it is enormous. Perhaps it is not as great in Florida as in some of the western states, but the damage done on western ranges runs into millions of dollars a year.

I wish it were possible in all of our veterinary schools to give a course in botany. Some schools do and some do not. I want to make an appeal to this group of veterinarians to become familiar with poisonous plants. This is an important problem with you in Florida. You probably have more poisonous plants than you suspect. I presume there are many cases of livestock poisoning in Florida, more than you are aware of. I am going to tell this story about a county agent in Iowa who sent me some spontaneous rye plants and wanted to know what it was. He didn't know rye when he saw it, but he was giving instructions to farmers in that state on agricultural plants. I do not know that any of you would make that mistake, but I do think the veterinarian and agriculturist should have a wide knowledge of plants, because livestock depend upon plants for their nourishment.

It is a hard matter to tell the effects of poisonous plants upon animals because different animals react differently, just as poisons on different persons act differently; what may be poisonous to one may not be to another.

I want to include in my discussion of this subject also plants which are more or less injurious in a mechanical way. As an illustration of mechanical injury, I may mention a very interesting story about the needle grass which we have in the North and Northeast, and you must have some of it in Florida. This grass has a sharp pointed callus which will penetrate the skin like a sharp needle. I am going to use this plant just as an illustration. Needle grass was common in the early days in Iowa and Minnesota. They wanted to get some sheep into western Canada and so the Hudson Bay Company sent down into Kentucky to get sheep. They bought about 1,200 sheep, and started out from Kentucky the latter part of March and then into Indiana and up into Illinois, and they were losing many sheep. They got up into Iowa and they lost more sheep. Out of that drove of 1,200 or more sheep they had lost all but about 250 when the party reached their destination. This needle grass produced a mechanical injury which resulted in pus infection and death of the sheep. That is the type of mechanical injury. This can come about through the barbs on greenbriar or smilax, the rose and blackberry.

I have here a plant known as the thistle, related to the Canada thistle, but is a native of Florida, which has sharp pointed spines on its leaves. These can penetrate the skin and produce foci of pus infection.

We have a plant known as wild barley. I think you have one kind of a wild barley found in this state closely related to our

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An impromptu address on Poisonous Plants given before the Florida State Veterinary Medical Association on February 21, 1927, at Gainesville, Florida.

barley, or squirreltail. If you pull the head when ripe, it comes all to pieces. These bristles work their way between the teeth of animals, and pus infection starts. Actually in the state of Wyoming and western Nebraska thousands of sheep are killed through the action of this mechanical injury and the resultant infection. There are other types of plants that produce injuries of this kind to animals.

In the South you grow crimson clover. The outer part of the flower has a little stiff point and when it comes in contact with the animal it sometimes gets lodged in the stomach, forming hair balls which produce serious trouble. The same thing is true of other spiny plants, like the cactus. If you go through any large packing plant you will find hair balls from the animals, and these are not uncommon. There are a great many plants that produce these hair balls. If you will permit me to use the technical name, let us call it the plant bezoar. One of the common ones in Mexico comes from cactus.

An interesting case occurred down in Mexico where the animals were feeding upon cactus, and it happened to be a bull. When the animal was dead, the veterinarians found in the stomach of that animal about 14 or 15 of these plant hair balls. You have some cactus in Florida which is a spiny flattened plant. This cactus has large spines and I am sure that under certain circumstances may produce these phyto- or plant-bezoars.

So much about the mechanical injury from plants. It is a rather interesting fact that when you come into a tropical country, and the dryer regions especially, you do have a large number of spiny plants. What are they for? A protective measure for plants. It is a means of protecting the plant, to guard against unwelcome visitors. You have plenty of spiny plants in Florida. In all dry regions and countries, plants develop a spiny character. If you go through one of the swampy places, you will find many plants that may cause mechanical injury.

Poisonous plants are not confined to higher plants. There are a great many belonging to the lower types. Permit me for a few minutes to discuss the latter with you, perhaps not altogether up to date, because I have not in recent years followed the subject in lower plants.

The subject of bacteria has been touched on by the preceding speaker, Dr. Fish, but I want to refer to the action of bacteria in another way. Bacteria as you know, are of two types, parasitic and saprophytic. It is a well-known fact that bacteria eliminate certain poisons that are generally called toxins, although at one time they were called ptomaines. These toxins are produced by the organism and are chemical substances that we do not know very much about. It is also a well-known fact that a great many of the saprophytic bacteria produce toxins. They are of unknown chemical composition. What are some of these bacteria? You are familiar with the record of persons who were poisoned by consuming poisoned food material. The organisms that produce these toxins in these cases were saprophytes. A great many cases of forage poisoning must be attributed to these saprophytic bacteria. You recall the instances of poisoning in California where people were consuming lima beans and olives. This food material was spoiled through the action of one of the bacteria which produces powerful toxins. We may call this botulism.

Let me now mention another line of possibility of poisoning. For instance, a great many different types of algae are found in stagnant water. Many of these algae are harmless. Wherever you find Spirogyra the water is not poisonous; it only occurs in pure water. But if the pond is covered with fine green material or blue-green material, the lower types of algae, you may expect some harmful action. Such water is not good for animals to drink. These algae probably produce some toxin and poisonous material.

These blue green algae are very closely related to the bacteria. The only difference is that the blue-green algae have chlorophyll and can manufacture their own food. I have heard a great many say that these algae are poisonous. In the North we have the blue-green algae which cause the working of the

lakes. These algae multiply and are carried by the wind from one side of the lake to the other. The algae that produce this blue-green pigment may then in some instances be poisonous and the water should not be used for drinking purposes. Dr. M. Stalker, who was one of the early veterinarians of the country formerly connected with the Iowa State College, called attention to the fact that the animals frequently suffer because they drank stagnant water in Iowa.

Let us leave the algae and take up a large group of plants known as fungi. I do not know how much botany you have had. Let me explain that fungi are related to the algae. They reproduce sometimes sexually and sometimes assexually, and sometimes in both ways. They do not have chlorophyll and are either parasites or saprophytes. I might mention a few instances of the toxic properties of some of these fungi. First, I want to mention some of the higher fungi, namely, the toad stools and their allies. You all know that some of them are extremely poisonous. The red cap of the fly agaric and scales on the top are characteristic. This fly agaric produces an alkaloid which is poisonous and even causes drunkenness. People use it for that purpose in Russia. This fungus produces an alkaloid for which there is an antidote. There are some related amanitas, one known as the death cup, which does not produce an alkaloid. It has a few scales on the top of the cap. It has a bulb at the base of the stalk. This fungus produces a saponin. Its action is to dissolve the red blood corpuscle, and when an animal does not have the red blood corpuscles they can not live very long. It produces slow death through the action of the saponin like substance which acts on the red blood corpuscles.

We have another class of fungi, of which I will mention only a few. We have some of these molds on grain and forage. There is no question but that some of these molds are poisonous. A large number of cases of forage poisoning may be traced directly to these molds that are found on these materials. A great many cases of this kind have been referred to me. These molds were found on all kinds of decaying herbage. It is very dangerous to feed livestock on this moldy forage. Then we have a type of fungus that is parasitic on plants, and you have plenty of these in Florida on paspalum. We will take the one occurring on the rye plant. You don't grow very much rye in Florida, but you do have an ergot that is found on some of your common grasses like the Saint Augustine grass (Paspalum). I am using the technical name because I do not know all the common names of the related grasses. These plants are affected with ergot. The ergot has an interesting life history. Rye becomes infected when it is in flower. The dormant stage of that fungus remains in the head. This ergot contains several powerful poisons.

Undoubtedly you are familiar with a rather interesting outbreak in Kansas that was investigated many years ago by Drs. Salmon and Stalker which many persons thought was foot and mouth disease, but which Dr. Stalker determined was ergotism. A dry gangrene sets in, the animal loses part of its tail and the teeth drop out. This is an example of fungus poisoning. You have plenty of this ergot on the carpet grass, etc., here in Florida. There are fungi related that have the same effect. One of them grows around the stem of some of our grasses. It surrounds the stem of the grass near the ground, killing the plant. This fungus (Epichloe) probably also occurs in Florida. It is common in the North. A Frenchman has reported it as poisonous.

Throughout the higher kingdom many flowering plants are poisonous. The grass family, the most useful in the world, has some toxic plants. What are these? One of them is known as darnel. This weed is sometimes found in oats. This darnel produces a fungus. By the way, it grows in the seed of the plant, seems to be associated with the life of the seed. The Bible mentions this grass as poisonous. It is one of the toxic grasses. Sudan grass, Johnson grass, and sorghum, related to corn but in different tribes, are under certain conditions toxic. If you allow the sorghum or Johnson grass to wilt, and especially if it is

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frosted, it produces a substance which is converted into prussic acid. The substance is related to a similar glucoside found in many plants which, when acted on by a ferment, is changed into a prussic acid, one of the most powerful poisons known. The sycamore and many other plants produce it. There are other toxic grasses, but I cannot take these up at this time.

Let us take up a few other families of plants. I have some poisonous plants on the table. These belong to different families and I would be glad to have you look at them. I have the China berry. I am glad to have learned since I landed in Florida that it is poisonous. It was not so recognized when I wrote that book on poisonous plants, though I have since recorded its poisonous qualities in VETERINARY MEDICINE. It is toxic to hogs, I learn from Dr. Fish and Dr. Gillis.

Let me take up the plants I have on exhibition. We come to the rose family, which is represented by the laurel cherry. You probably also have another cherry, the choke cherry. The black or rum cherry is common and the pungent odor coming from it is known as amygdalin, which is converted into hydrocyanic acid or prussic acid. It is rather interesting to follow out the history of poisoning from these plants. Long before we knew anything about the chemistry of these toxic principles of the cherry and peach, the ancients were quite familiar with the poisonous actions of these plants. The same principle occurs in the pit of the peach, and the ancients used the seed of the pit of the peach to produce poisoning.

I am sure that somewhere and at some time in this state you will come across poisoning from this black cherry or the laurel cherry.

Another interesting plant is the poison ivy of the sumac family. I know that most of you are familiar with it. It is as common in the state of Florida as in Iowa. It produces dermatitis, but I do not know of a single case of poisoning to lower animals. It is injurious to a great many people; some are very sensitive. A great many investigations have been made on the chemistry of the poisons, but no one has found out the exact definite chemical poison. It seems to be a somewhat volatile oily substance. By the way, if you want to know the method of treatment, the poisoning can be counteracted by washing with soap and water immediately after coming in contact with the plant. If you are going where there is poison ivy, take soap along. It seems to indicate that the substance is an oily material. Some company is advertising a special preparation which is said to be very effective for this type of poisoning.

You also have a nettle and a spurge which act on the skin.

Mention of the fern family has been made and some are known to be poisonous. The common brake is abundant. The "root" is black or dark brown. The plant grows three or four feet high in Washington and Oregon. Since my book was written, a number of persons in Washington and Oregon, where this plant grows very tall, report it as poisonous. Quite a number of other ferns are poisonous, some strongly, especially the marginal fern. We have some in Iowa, and you probably have some around Tallahassee. They are toxic and produce a substance known as filicic acid.

I have here the chick weed of the pink family. It grows everywhere in Florida. It is a common weed—has a little, inconspicuous flower. It is related to the corncockle. The chick weed is not so very poisonous; chickens seem to be more frequently poisoned than other animals. There are a number of plants of this family which you should avoid. One of these is known as the bouncing betty. It occurs in Iowa. I do not know whether it is common in Florida or not. The bouncing betty, if you put it in water and stir or beat, will lather like soap. It is, therefore, sometimes called the soap plant. The chick weed, bouncing betty, and corncockle produce a substance known as saponin. You will find the same substance produced in many other plants, bacteria, and fungi; and these plants all have the same effect upon the system—that is, they dissolve the red blood corpuscles. Your yucca produces it.

I have another interesting plant known as

the yellow jasmine. I have not seen this consumed very much by livestock.

Jasmine is related to strychnin. There are two poisonous substances in jasmine—gelsemin and gelseminin. I mention this plant because people generally do not know that it is poisonous.

I have here red cedar of the pine family, but not very poisonous. The berries are, however, poisonous and cases of poisoning have been recorded.

I have here a number of plants of the heath family. The first is azalea, which is cultivated. There is also a native one in this state, as well as the related species of rhododendron found in the Alleghenies and an azelea found in California, which are known to be poisonous.

You have a great deal of the fetter bush. This and its allies produce a strong toxin andromedotoxin; and, by the way, the mountain laurel is rather common in the north, but not in this state.

Dr. H. Kurz of the Florida State College for women took us over to Bristol and on the way we found a patch of the mountain laurel. The leaves of this evergreen shrub contain andromedotoxin. In the Alleghanies, New York, Pennsylvania, and New England there is a great deal of the mountain laurel. The honey made from mountain laurel is poisonous also.

I have here the wormwood (Chenopodium). That is quite toxic. The plant is a naturalized weed and has a strong odor. It is related to lamb's quarters.

I have also a specimen of the sheep sorrel of the smart weed or dock family, and along with it is the yellow or field sorrel. The sheep sorrel belongs to the same family as the yellow dock. It is extremely common in Florida. Possibly you have heard of cases of poisoning from these plants. I have recorded a number of cases. In some sections of the country considerable complaint has been made from the poisonous properties of sheep sorrel. It contains the potassium oxalate in a soluble form. By the way, somewhere in VETERINARY MEDICINE I published an account of poisoning from yellow dock and sheep sorrel.

I have here what is known as the coffee bean (Glottidium), which is related to sesban. It is a common weed everywhere in Florida. The first cases of poisoning from sesban that came to my attention were reported to me from South Carolina by Dr. A. P. Anderson. That plant is certainly poisonous.

A species of cassia, or partridge pea, is poisonous. That leads me to say something about this family of plants, the legumes. On the whole, the plants of this family are useful edible plants, such as the soybeans, clovers, etc., but it is an interesting fact that in that family we have some of the most poisonous plants known to man. You veterinarians are familiar with the calabar bean. It used to be known also as the ordeal bean. It is a tropical plant and is used by veterinarians. Many years ago I gave a course in medical botany. I had some twenty veterinary students, and I had a box of calabar beans, one of which was broken open. I said, "Boys, don't eat them as they are poisonous." One of the fellows didn't believe me. He ate nearly a quarter of a bean. It acted as a powerful purgative, which saved his life and spared his friends from taking him to the cemetery.

We have the rattle box crotalaria, which is poisonous. You have one species with yellow flowers in Florida. Loco weeds belong to this family, of which a large number are toxic plants. Some people may say that this is a myth, but it is not. These several types all cause poisoning. The crotalaria or rattle box of Iowa causes a disease which is called crotalism. It is an interesting fact that there is a plant in Australia and one in South Africa which produce loco poisoning. The North America plant is related to the Australian and South African. The diseases are all identical, which goes to prove that these plants which are in the same family and closely related are poisonous. I do not put much stock in the theory that it is on account of the mineral poisons in these plants. Of course, not all of the vetches are poisonous.

Then we have the garget or poke weed. Some people say that it is not poisonous.

The young leaves and shoots, when boiled, are eaten, but the fresh roots and leaves are poisonous.

I wanted to bring in to you an oleander. Quite a number of cases of poisoning from the oleander are recorded for Arizona. The plant runs wild in Arizona and when the livestock feed upon it, they are frequently poisoned. The honey that comes from the oleander plants is poisonous also. It contains what is known as nerin. The related Indian hemp of the same family is poisonous.

Then we have another family with a few poisonous plants. They are known as the compositae or sunflower family. I have one here which is known as Baccharis halimifolia. I should like some good authentic cases of poisoning from this plant. Can you not assist me to find out whether this plant is poisonous? The kind that grows in the northeastern part of the United States is reported as poisonous. Your plant is very common on these low, somewhat salty marshes in the southern states.

The carrot family contains quite a large number of toxic plants. What are they? The plants resemble the carrot in flower. I am sorry that Drs. Sanders, Gillis and myself could not get any of the plants for you. First, we have the cowbane. You have it in Florida, I am sure. It has white flowers occurring in umbels. The leaves are large, divided, the roots fleshy and fascicled. We know in Iowa, where the plant passes through the winter freeze, that it is very toxic in the spring. It is not toxic while growing. I made an experiment with the plant in the growing stage, but the animal did not get sick. People are generally poisoned in the spring. Where it has been kept through the winter, then it is deadly poisonous. What applies to man is also true of lower animals. Some years ago two boys were out at a place about four miles from the city of Boone, Iowa. A man was plowing a prairie sod and turned up the roots. The boys asked him what the plant was. He told them parsnip. They had heard about parsnip. One boy ate some of it and the other did not. The boy that did not eat any took the other boy to a house nearby and called the doctor. The doctor came and took this boy to Boone, but by the time he was on the second floor of the hospital he was dead.

I published a little paper on cowbane poisoning. I made this statement: I said the parsnip running wild is not poisonous. We had a good old horticultural foreman at Ames, a Mr. Sexton, who said I was mistaken. So he came to me and brought me in a piece of parsnip root. I ate part of the piece and he came back the next morning and found that I was still alive. It is not poisonous, but the flowers of that plant may produce a poisoning similar to poison ivy.

I did not complete the story about the cowbane. One boy, as I said, was poisoned and died; the other did not eat any. The physicians wanted to know what this plant was. They took this chap out to the place and the boy found the plant for them. He did not eat any of the plant. He picked it up, and must have had sores on his hand; he died in about a week. The first boy died from eating the plant and the second boy from getting it on a sore where the toxin was absorbed. It is the most powerful toxic plant in North America. The toxin seems to be most poisonous during the resting stage of the plant. This condition occurs only after the material is stored away in the root of the plant. Related to it is the poison hemlock of the ancients. I do not know whether it occurs in Florida or not, but I want to mention it. It is one of the oldest known poisonous plants in the Mediterranean region. It has a large leaf. If you touch the plant, it smells like corn over which mice have run. The plant was used by the ancients to kill persons they wanted to put out of the way. Socrates died from taking a tea made from this plant. This plant contains the alkaloid coniin. I found the plant last fall in Iowa and published a note in the newspaper. This was widely copied and proved of interest to many readers because the name of Socrates who has had great influence on present day thinking. This poisonous hemlock is common in Utah and the

Pacific Coast, and is just coming into Iowa. Possibly you may have some in this state, I do not know.

The spurges, like the bull nettle, are poisonous. All of the members of this family produce poisoning similar to poison ivy. The nettle of the nettle family also causes dermatitis. You have one type in Florida, the Cnidosculus.

Here is a member of the night shade family. The plant belongs to the same family that the potato does. There are a large number of plants of this family which are poisonous. Tomatoes is another; the green leaves are toxic. This family of plants, next to the carrot family, has probably the most toxic plants of any family in the United States. One is the black henbane. I do not know whether that occurs in Florida, but it does occur in Iowa and Eastern North America. You all know the effect of the hyoscyamus on the system and that it is found in the black henbane. The jimson weed has a similar substance. So many of the plants of this family have been looked upon with suspicion, and it is a well known fact that some people would not, in the early days, eat the tomato because it was thought to be poisonous. They tell the story about people who ate the berry of the black henbane or night shade and found that it was poisonous. It contains an inebriating substance. I think the fruit of the black night shades is not as poisonous as it is reputed to be, because out in the Dakotas this plant comes up in great quantities; in Iowa, too, after the grain is removed; and they sometimes collect the berries and sell them for blue berries. The wonder berry that Burbank has produced is one of the hybrids. Probably the berries of the black night shade are not so toxic as people think, but the green plant is toxic. There is a related species, the three-flowered black night shade, in the western plains country, that is extremely toxic.

The question has been asked whether millet is poisonous. It depends upon what is meant by millet. If it is one of the sorghum millets, very likely it produces prussic acid under certain climatic conditions.

BOOK REVIEW

The Bureau of Animal Industry, Its History, Activities and Organization. Service Monograph No. 41. Institute for Government research. Cloth bound, 190 pages; price $1.50. Obtainable from The Johns Hopkins Press, Baltimore, Md.

The Institute for Government Research is an association of citizens for cooperating with public officials in the scientific study of government with a view to promoting efficiency and economy in its operations and advancing the science of administration. It aims to bring into existence such information and materials as will aid in the formation of public opinion and will assist officials, particularly those of the national government, in their efforts to put the public administration upon a more efficient basis.

These monographs are all prepared according to a uniform plan. They give: first, the history of the establishment and development of the service; second, its functions, described not in general terms, but by detailing its specific activities; third, its organization for the handling of these activities; fourth, the character of its plant; fifth, a compilation of, or reference to, the laws and regulations governing its operations; sixth, financial statements showing its appropriations, expenditures and other data for a period of years; and finally, a full bibliography of the sources of information, official and private, bearing on the service and its operations.

These studies are wholly descriptive in character. No attempt is made in them to subject the conditions described to criticism, nor to indicate features in respect to which changes might with advantage be made.

While this report offers no criticism and no comment on the activities of the B. A. I. other than what is explanatory, it nevertheless pays the Bureau a high tribute in the closing paragraph of the history of its 45 years of service. The paragraph reads as follows:

"With a long record of accomplish-

ment, the Bureau today occupies a position unrivaled in any country in the world. It has grown with the industry which it was established to foster, changing its emphasis as that industry has developed. It is no less concerned with the quality of the export surplus than it was in the eighties when that surplus was embarrassingly large; but since 1906 it has been increasingly active in the interest of the domestic consumer, and this without lessening its effort to serve the stockman, whether through combating disease or promoting more economical and efficient methods of production and utilization."

That the Bureau should have been accorded such a commendation as a result of this impartial, unprejudiced and wholly independent investigation must be a source of gratification to all who by their services have contributed to its achievements.

Nearly one-half of the volume is devoted to the organization of the Bureau, possessing interest chiefly for administrative officers of the government, and for employes of the Bureau. The chapters on History, Activities and Publications possess much of interest to every veterinarian.

TREATMENT FOR STOMACH WORMS IN SHEEP

What is the best method of treating a large flock of sheep for stomach worms? —P. S., Wis.

Reply: Use the copper sulphate treatment.

Make up a copper sulphate solution by dissolving four ounces of copper sulphate in three gallons of water. Give lambs weighing 40 pounds, two ounces of the solution. Sheep weighing 80 pounds or over, four ounces.

Use three feet of thick rubber hose with a three-eighths of an inch aperture. In one end of the hose, insert a granite funnel, in the other insert a six-inch copper tube to be placed in the mouth of the animal.

Make certain the lambs are standing on all fours before the fluid is poured into the funnel. It is best to drive several into a narrow chute and dose individually, making certain that they swallow naturally.

If the herd cannot be placed on a clean pasture, they should be dosed monthly. This will control the infection.

The size of the dose is the one recommended by Dr. Cooper Curtice.—H. B. R.

MANY SUBSTANCES TESTED AS REPELLENTS OF BLOWFLIES

Certain species of blowflies—primarily the screw-worm fly and secondarily, the green-bottle fly and the black blowfly—cause losses estimated at $4,000,000 or more annually because of their attacks on live stock. They are of particular concern to raisers of cattle, sheep, and goats on the ranges. When the screw-worm flies are abundant they are strongly attracted to the slightest scratch of blood spot on the skin of an animal. Under favorable conditions they lay eggs in such wounds, and the larvae hatch and start feeding on the living tissues. If treatment is not administered promptly death of the animal often results.

Ranchmen are using various home remedies, such as axle grease and lampblack, but probably proprietary "screw-worm killers" of one sort or another are now most prevalently used. These consist largely of crude carbolic acid, which, although it kills the worms with which it comes in contact, is also very poisonous to animals. As a result many animals are killed by the treatment.

In view of this situation the United States Department of Agriculture has for some time been engaged in a study to find a material that will kill the larvae and prevent reinfestation by repelling the flies. In all, about 350 compounds and mixtures have been tested to determine their repellent or attractant action. The results of this study, as applied to the screw-worm, are reported in Department Bulletin 1472-D, "Chemotropic Tests with the Screw-Worm Fly," just issued and now ready for distribution.

A number of the essential oils are good repellents, among which are Ceylon citronella oil and American pennyroyal oil, commonly used as mosquito repellents. Powdered pyrethrum and derris, both of which are valuable contact insecticides, are effective in repelling screw-worm flies. Of all the materials tested as repellents against the screw-worm fly, however, certain products obtained from the pine are among the best. These include pine oil, crude turpentine, pine tar, and pine-tar oil. In view of the cheapness, availability, nontoxicity, and adhesiveness of pine-tar oil, the investigators are of the opinion that this is the best material among all of those tested to use upon wounds of domestic animals to protect them against the screw-worm fly.

A copy of the bulletin may be obtained as long

as the supply lasts by writing to the United States Department of Agriculture, Washington, D. C.

Tuberculosis of the uterus and abortions resulting therefrom should be given consideration; thus of 834 consecutive fetal membranes from cows examined in the serum laboratory at Copenhagen, Denmark, 1.79 per cent were tuberculous and about 2 per cent of the cows slaughtered in abbattoirs in Denmark have tuberculosis lesions in the uterus. The avian type of tubercle bacillus has been demonstrated in a large percentage of the uterine tuberculosis of bovines in Denmark and unfortunately cows infected with the avian type of the bacilli do not react to the regular tuberculin test.

The whipworms from man and swine are indistinguishable morphologically.

TEST OF ANESTHETIC

A favorable report was rendered at a recent meeting of the Berlin Medical Society on a new Dye Trust (I. G.) anesthetic, known so far as "E 107." This is said to be a bromine preparation with the advantage of being introduced in solution rectally into the intestinal canal, producing general anesthesia.

Subjectively, "E 107," with almost instantaneous effect, is said to relieve the patient of the anguish and excitement often accompanying the taking of other anesthetics. Heart and pulse are said to remain normal and blood pressure is not reduced, nor are nerves or lungs damaged in the taking. Even patients over 70 years of age have taken it without disturbance. No disagreeable after effects were observed. Chloroform, ether or other anesthetics can be given additionally in special cases.

A final appraisal of the new anesthetic is not given as yet, because of lack of entire agreement in the profession, and further experiments are awaited. The majority, however, characterize "E 107" as an advance beyond other inhalation anesthetics, and foresee its acceptance by the profession.

DOG RECOVERS FROM INTESTINAL RUPTURE DUE TO INJURY BY AUTOMOBILE

A hound dog that was run over by an automobile was presented as a surgical patient at my infirmary on December 30, 1926.

The following symptoms showed upon examination: Pulse imperceptible, respiration stertorous with prolonged expiration, copious hemorrhagic discharge from mouth, nose and anus.

My prognosis was unfavorable, but owner decided to take any chance there might be of saving animal and ordered treatment instituted.

After preparing patient for the operation room by cleaning up and administering hypodermic injection of 1/60 grain of atrophin sulphate with additional hypodermic injection of cactin, strychnin and glonin, the animal was given the anesthetic which was ether of course.

Upon opening the abdominal cavity, I found considerable little bloody ingesta and urine spread around and through a much lacerated omentum. There were several ruptured places in the small intestines, a ruptured bladder and the right kidney floating.

After removing the lacerated portions of omentum and emptying the intestines as far as possible through the ruptures, the edges of these wounds were trimmed off and sutured with the usual intestinal anastomosis technic.

My attention was then turned toward the urinary system. I anchored in kidney to its original position, cleaned out the bladder using normal saline solution, and forcing some through the urethra. I then sutured the ruptured bladder using the same style of sutures as for the intestine.

The next step was to flush out the abdominal cavity thoroughly with normal saline solution, taking plenty of time and repeating this procedure several times.

The abdominal walls were closed by interrupted sutures (buried). The skin was closed by continuous sutures.

I then injected into the abdominal cavity

one quart of normal saline solution, removed the patient to the canine ward, packed with warm water bottles and blankets. The after treatment consisted of the administration of a mixture of gruel and milk via the rectum for ten days; then tablespoonful portions by the mouth.

The animal made an uneventful recovery.

In bringing this case to the attention of the profession, I hope it will inspire in the hearts of all who may read it that the old adage of, "never give up," is a good slogan for a surgeon.

Geo. E. Bitgood.

New London, Conn.

RICKETS AND PARALYSIS IN SWINE AS AFFECTED BY NUTRITION*

Lameness, unthriftiness, partial paralysis, or rickets in pigs is very prevalent especially in the winter and early spring. These difficulties, in the life of a pig, may be closely related as to their cause. It has been demonstrated that deficient rations will cause such ailments which affect not only the bones, but also other tissues of the body, especially nervous tissue. Apparently there is something lacking in winter rations that is usually contained in rations in the summer when rickets or lameness rarely occurs. Pasturing pigs has been found a preventive.

A ration composed of grains or seeds generally, as well as of their by-products —or such a mixture as white corn, flour wheat middlings, linseed meal, and salt— has repeatedly been found to produce unthriftiness, rickets, and death, in pigs. Many pigs are found "going-down behind," which trouble many hog growers attribute to kidney worms.

Grains or seeds and their by-products, used so generally in winter rations of hogs, do not furnish enough nor the right kinds of minerals and vitamins. It is due to these two deficiencies, apparently, that trouble occurs. Both minerals and vitamins are necessary. The addition of lime (calcium carbonate), phosphates (di-sodium phosphate), or bone flour, without the addition of vitamins, does not prevent paralysis.

The addition of vitamins as carried by cod-liver oil furnished a strong growth impulse, but, in the absence of minerals, made for brittle bones that were easily broken. It has happened that a mere twist of the hand would break the hind leg of a vigorous 115-pound shote. Many so-called spontaneous bone fractures occurred in lots of pigs fed the basal ration and cod-liver oil alone. Feeding both cod-liver oil and bone flour, or what appear to be the essential vitamins and minerals, together, made for best results, producing the most uniform and economical gains. None of the pigs became stiff or rachitic. It appears as if vitamins and minerals go hand in hand for proper growth of bones and other tissues.

Both vitamins and minerals in a ration are necessary for proper growth and health of pigs. Best results were not secured when either vitamins or minerals alone were fed. Precipitated bone flour appeared to be somewhat superior to either calcium carbonate or di-sodium phosphate, but autopsies revealed that the kidneys of all pigs fed the precipitated bone flour had mottled kidneys, suggesting a toxic effect of this by-product. Blood meal in the several experiments conducted had an unmistakable tendency of hurrying pigs into rickets or paralysis. Proteins did not appear to play as important a part in relation to rickets and paralysis as did minerals and vitamins.—Ohio Agr. Exp. Sta.

*Excerpted paragraphs from the Quarterly Bulletin of the Ohio Agricultural Experiment Station.

Four horses and two mules died within ten days on a farm in west central Missouri. All of these cases manifested the same general symptoms. The affected animals would be found down and unable to rise. Temperature and pulse normal. A fair appetite in the beginning. All of the affected animals died within 48 hours after the onset of the disease. Autopsy revealed myriads of strongyles and some involvement of the mesenteric arteries. All remaining animals were purged and given Fowler's solution twice daily. Was this condition strongylosis?

MINERAL AND VITAMIN REQUIREMENT FOR CHICKENS*

The source and amount of protein concentrate may be greatly varied for chickens but the mineral requirement is very exacting and under no circumstances should a ration be allowed to become deficient in the essential minerals.

The mineral factor in rations for chickens is of prime importance and should be given careful consideration in every ration.

Green feed, especially lettuce or cabbage, also proves a valuable addition to the ration for confined chicks.

The deficiency of minerals appears to be more responsible for the failure of cottonseed meal in the ration for growth of chickens and egg production than the quality of its proteins or other properties. Although the addition of minerals more than doubled the value of the cottonseed meal ration for egg production it only reached 85 percent the value of the meat-scraps ration. From these results it would seem that cottonseed meal can not be successfully used to replace meat scraps in the ration for layers. This does not mean that a partial replacement could not be made to advantage.

Protein for chickens may be supplied from a variety of sources, mostly vegetable, provided a suitable mineral supplement is employed.

More than one-third of the total dry matter of an egg is mineral matter, chiefly lime of the shell. Hence laying hens not only require the minerals essential for growth and body functions but a large additional supply of lime for egg shells. Wheeler reported that ordinary feed and water supplied but 15 percent of the lime requirement for egg shell formation. Oyster shells are usually employed to supply the balance of the lime needed. Since oyster shells are available locally in but few of the poultry producing states other sources of lime for this purpose are desirable.

Typhus fever has been identified in some of the southeastern states. Fortunately the cases so far reported have in most instances been mild.

*Excerpted paragraphs from the Quarterly Bulletin of the Ohio Agricultural Experiment Station.

The percentage of iron in milk from different cows may vary as much as 100 per cent. The iron content of milk from cows is not influenced by the iron content of the feed.

CONSUMPTION OF MILK RAISED BY CAMPAIGN

The "Milk-for-Health" campaign, the Department of Agriculture announced on April 15, has increased the consumption of milk in the United States approximately 27 per cent in the eight years for which results have been checked.

As the result of more than 60 separate drives in which the Department assisted in 1918-1925, it was stated, an average reduction of 12 per cent in undernourishment among school children has been accomplished.

ECONOMIC IMPORTANCE OF SWINE TUBERCULOSIS

The actual money losses occasioned by swine tuberculosis cannot be accurately estimated for the country and state as a whole. That the losses are a conspicuous part of the annual waste occasioned by animal diseases there cannot be any doubt. The losses in federally inspected abattoirs on account of condemnations and retentions are only an indication of the importance of the disease, and to those losses must be added the ones sustained by local butchers and the ones occasioned by deaths and unthriftiness of the swine on farms.

As far as can be estimated, the actual cost per hog slaughtered cannot be less than 16 cents per head for Nebraska swine and as much as 25 cents to 30 cents per head for Wisconsin.

If we accept the smaller figures as the average cost for the country at large, the loss sustained by the farmers of the United States by retentions at packing centers cannot be far from $5,600,000 per year. When to this item is added the losses among swine not killed under federal supervision, and the ones on farms occasioned by deaths and unthriftiness, the total loss caused by swine

MAY 22 '27

tuberculosis in this country cannot be far from $9,000,000 per year.

The actual money loss to Nebraska farmers arising from this source cannot be estimated at less than $1,000,000 per year. For one large market alone it has been calculated that Nebraska shippers would for every week of the year take home with them $10,000 more than they do now, if hog tuberculosis could be eliminated from their herds. —L. Van Es.

CAN THE VETERINARIAN AFFORD TO BE ETHICAL

Professional people are usually critical of what they call "Advertising Hot-Air" or "Mere Sales Talk." They often declare that they pay little attention to advertising, and yet the truth is that they read much in the way of advertising matter that is valuable to them without being conscious that such material is advertising. It therefore is necessary for an advertising man to write tactful copy.

The man who can define the ethics of advertising as applied to the veterinarian, to so fine a degree of perfection and explain it sufficient to have it accepted as authoritative, is not yet born. I do not expect to be quoted as an authority of this rather ticklish subject but merely present my views which I'm quite sure do not agree with the majority of the readers.

Modern life is complex. Competition is keen. Thousands are offering their services and unless you set ethics to one side and tell the public what you have to offer, they are apt to mistake your silence for inefficiency. The farmer (your prospective customer) is strictly commercial. A veterinarian's service is enlisted to assist Mr. Farmer in conserving that which represents an investment. A veterinarian then is an accessory to a commercial enterprise and must concede to being an instrument of commerce. Your livelihood depends upon the commercial man and your appeal must be made from a business angle and in order to prosper you must sell your "wares," which of course are your services.

There are some who will take exception to this remark and contend that if a service is meritorious it will advertise itself. That is true to a limited extent. Some of the most effective advertising comes from what satisfied customers say. The difficulty with that kind of advertising is that it usually does not go far enough or spread rapidly enough to compete with the man who is convinced that he has something worthy and does not hesitate to say so with the printed word.

Business is no longer a man to man contact, in which the seller and the buyer establish a personal bond any more than battle is a hand to hand grapple wherein bone and muscle decide the outcome. You can no more expect a twentieth century success with nineteenth century methods than you can wear the same sized shoes as a man which fitted you in boyhood.

Advertising is not a debatable policy. It has proved its case. Servicing hogs, cattle, etc., is the veterinarian's business. Now then, advertising is to business what hands are to a clock. It is a direct and certain means of letting the public know what you have to offer and what you are doing. It these days of intense and vigilant commercial contest, a veterinarian who does not advertise is like a clock without hands. He has no way of recording his movements.

Advertised painless dentistry has been helpful to humanity, so can the veterinarian's services be expected to serve humanity by conservation of food, etc. Advertising is bound to convince the public at large that the veterinarian's service is indispensable. Unless you educate the public to this you are not apt to make much progress. Remaining silent, or rather, I should say ethical, will not accomplish the purpose.

Are veterinarians more ethical than dentists? Do they not enjoy the glory of being addressed as "Doc." Are the dentists less proud of the extra initials that are tagged on to their signatures? Don't they, too, assume the dignified aloofness that their diploma entitles them to? Don't they too—belong to the professional class?

I have tried to the best of my ability to write of conditions as I find them looking through the eyes of an advertising man and

offer some logical reasons why I believe the veterinarian should advertise in order to keep abreast of the times.

Morton Loonan,
Adv. Mgr. Liberty Laboratories.
Ralston, Nebr.

SWINE POISONED BY CHINA BERRIES

Three years ago I was called to an adjoining county to administer anti-hog cholera serum and hog cholera virus to a small herd of poland china hogs. The animals were observed at the time of inoculation to be in apparently a healthy and thrifty physical condition. Five weeks later I was called back to this same herd to investigate the cause of the death of four of these animals. The history was as follows: All of the hogs had been doing nicely since they were inoculated, until the sudden death, or rather the finding these four animals dead in the pasture. I found, upon inquiry, that they had been changed from the pasture in which they had been kept, to the one in which the trouble was observed, the day previous to the finding of the dead hogs. I also noted that the pasture was very short Bermuda grass and that no other feed had been available. It was during a very dry season, during which time the grass grew slowly and there was not much to be had. In one corner of the field stood two china berry (umbrella) trees, providing a shade for the hogs during the heat of the day. Autopsies revealed the fact that the dead hogs had consumed the berries which were found in the stomach. Ordinarily, I do not believe livestock will eat the china berries, but in this case they had, which I attributed to the absence of feed or pasture sufficient to satisfy their hunger. I have also observed hogs kept in a pasture in which china berry trees were located in which no trouble was reported, but they were provided with sufficient feed. In the above mentioned case I observed that there was no other materials present in the stomach contents aside from the berries, except a negligible amount of grass. I advised the owner to remove the hogs to another pasture, which was done without delay, and to supply sufficient feed for them. No further losses occurred.

Ocala, Fla. H. C. NICHOLS.

MODEL MEAT INSPECTION ORDINANCE

I would appreciate it very much if you will supply me with a model meat inspection ordinance for a municipality. I would prefer copy of an ordinance that has been tried and found practical, suitable for a small city. —D. R. B., Minn.

Reply: The form of an ordinance such as is requested, would vary in different states, since the degree of local self government accorded municipalities varies with the type of charter granted by the different state legislatures.

The Bureau of Animal Industry will supply, on request, a model ordinance for meat and milk inspection that is capable of being adapted to varying local conditions. The U. S. Public Health Service, Washington, D. C., will also, on request, supply information on this subject. The milk inspection ordinance of the latter organization, however, does not require a veterinary qualification for milk inspector.

The following county meat inspection ordinance is said to work satisfactorily, and seems sufficient in scope to provide for an adequate inspection:

Meat Inspection Ordinance—Santa Cruz County, California

The Board of Supervisors of Santa Cruz County do ordain as follows:

1.

All livestock entering the County of Santa Cruz by any method of transportation or by driving on the hoof for the purpose of immediate slaughter, must move directly to the premises upon which they will be slaughtered, except that such livestock in railroad shipments may unload enroute to comply with the provisions of what is known as the 28-hour law of the United States Department of Agriculture.

2.

Every person, firm or corporation who shall engage in the business of slaughtering cattle, sheep, swine or goats for human food, shall, except as herein otherwise expressly provided, slaughter all such animals in a regularly established slaughterhouse duly accepted as such by the County Veterinarian, as is hereinafter expressly provided. The proprietor and operator of each slaughtering, packing meat, canning, rendering or similar establishment, engaged in

the slaughtering of cattle, sheep, swine or goats for human food; or in the packing, canning or other preparation of any food product for human consumption in which meat is used, shall procure and have in writing a permit from the County Veterinarian. The County Veterinarian shall have power to impose reasonable sanitary conditions and requirements in the granting of such permit, or to refuse to grant such permit or to revoke the same if the person to whom the permit is issued does not comply with the reasonable sanitary regulations required by the County Veterinarian. The decision of the County Veterinarian in granting or revoking such permit shall be subject to appeal to the Board of Supervisors. Such appeal must be made by a verified petition fully setting forth the facts, and shall be set for hearing at the next regular meeting of said Board of Supervisors after the appeal is filed. The term "Business of Slaughtering" as used in this section, shall apply to all persons, firms or corporations who more or less regularly buy animals for the purpose of slaughtering them, and for the purpose of selling the meat product either at wholesale or retail. It shall not apply to the slaughtering of cattle, sheep, swine or goats by the raisers thereof for their own use.

3.

Any person, firm or corporation desiring to slaughter any cattle, sheep, goats or swine for human food, shall give notice to the County Veterinarian of the time and place where and when such slaughtering is to take place, at least twenty-four hours before such slaughtering is to take place. Whenever practical, said County Veterinarian shall witness the slaughter, and shall in so far as he deems it necessary, superintend the preparation and care of meat products. The carcasses of animals which were not slaughtered in the presence of the County Veterinarian shall have on them the thoracic organs and liver attached thereto by the natural attachments, until said County Veterinarian shall have inspected the said carcasses. If upon examination the said County Veterinarian shall find such carcasses free from disease and otherwise sound, healthful, wholesome and fit for human food, and if it appears to his satisfaction that the same were killed and handled in a clean and sanitary way and manner, and have been properly protected, the same shall be marked as inspected and passed. If any carcass is found unwholesome, unsound, diseased or otherwise unfit for human food by reason of the manner in which the same was killed, handled or transported, or for any other reason, said County Veterinarian shall require the same to be destroyed for food purpose. In making inspections, condemnations of meat or meat products under this ordinance, the County Veterinarian shall be governed by the "Regulations governing the meat inspection of the United States Department of Agriculture" now in force and such regulations (so far as applicable) are hereby adopted as the regulations of the County of Santa Cruz governing meat inspections.

4.

Persons, firms or corporations engaged in the business of slaughtering animals shall by arrangement or agreement with the County Veterinarian designate the time at which such slaughtering shall be done.

5.

All parts of the slaughtering establishments including the slaughter-house, storage rooms for meats and stables or corrals used for livestock, shall be kept in a clean or sanitary condition.

6.

The blood and offal shall be handled and disposed of in such a manner as not to permit any decay or offensive effluvia to emanate therefrom and it shall not be used in its raw state for hog food.

7.

The slaughter-house shall be provided with a cooling-room apart from the killing-room and shall be separated from the killing-room by a tight partition. All rooms shall be thoroughly ventilated and well screened so as to exclude flies and other insects therefrom.

8.

Cattle shall be allowed to stand a period of at least eighteen hours, and calves and small animals six hours before killing, unless in the judgment of the County Veterinarian such animals are suitable for slaughter at an earlier period.

9.

It shall be unlawful for any person, firm or corporation to sell, have or expose for sale for human food, the flesh or meat or carcass of any cattle, sheep, swine or goats, unless the same shall have been slaughtered, prepared, passed and officially marked by the County Veterinarian as provided in this ordinance or by the United States Department of Agriculture, the state of California Department of Agriculture or any other city or county having regulations equal in strictness to those of Santa Cruz County.

10.

The County Veterinarian shall wear on the left breast while in the performance of his official duties a badge. It shall be unlawful for any person other than said County Veterinarian or persons acting under his directions, to have in his possession, keep or use any mark, stamp or brand provided or used in marking, stamping or branding as inspected and passed any article herein required to be so marked, stamped or branded.

It is further provided that said County Veterinarian insofar as is practical shall give assistance and advice to stock raisers in the prevention of contagious diseases among stock.

11.

In the performance of his official duties the County Veterinarian is hereby authorized and empowered to enter at any time any slaughter-house, meat market, dairy, creamery, butter and cheese factory, milk depot or any other place or places where meat or meat products, dairy or dairy products are sold or kept for sale, or kept in preparation for sale, or any railroad cars, wagons, trucks or other vehicles used in the transportation of such products. He may take samples anywhere of dairy products or imita-

tions thereof, and cause them to be analyzed or subject to a bacteriological test; such analysis or test shall be recorded and preserved.

12.

It is further ordained by said Board of Supervisors that the County Veterinarian at such time as he may deem proper, shall cause to be inspected all places where dairy products are made, stored or preserved for food and sale and all places where cows are kept by persons engaged in the sale of milk or cream; that said County Veterinarian may require the correction of all unsanitary practices or conditions found to exist in any such places.

13.

No carcass of any animal. no fresh or cured meats or meat products, shall be exposed to the open air, to the action of moisture, soot, dust or flies, in front of any shop, store, or other place, nor be transported in a wagon or other vehicle in the County unless fully protected from moisture, soot, dust and flies by the use of closed and covered vehicles or the use of clean cloths sufficient in size to completely cover the contents of such wagon or other vehicle. All meats retailed must be delivered in a sanitary manner.

14.

Any person, firm or corporation violating or assisting in the violation or advising the violaton of any of the provisions of this ordinance is guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than Twenty-five Dollars ($25.00) nor of more than Five Hundred Dollars ($500.00) or by imprisonment in the County Jail not to exceed six months or by both such fine and imprisonment.

15.

Inspection fees shall be collected by the County Veterinarian from the owners, as follows to-wit:

Beef .....$0.85 a head
Hogs and Calves..... .25 a head
Sheep and Goats..... .15 a head

All fees to be paid into the County Treasury.

This ordinance shall be in force and affect thirty days from and after its passage.

Several cows, dairy and beef types, that were running on blue grass pastures in the vicinity of Kansas City, died during April this year (1927). The first indication of the disease is the cow is down and unable to get up. Most cases die within 12 to 24 hours. A few cases have recovered. Postmortem examination shows numerous petechial hemorrhages on the epicardium and in the lung. The B. bipolaris can be isolated from the heart blood in most cases and vaccinating with hemorrhagic septicemia bacterins appears to stop further losses. There has been some question concerning the diagnosis of hemorrhagic septicemia because the disease affected only mature cattle.

FOX AILMENTS OF DIETARY ORIGIN

It gives me great pleasure to compliment you and Dr. Kinsley on your publication—VETERINARY MEDICINE. I believe the March issue is the best, to my way of thinking, I have ever read—especially your notes on small animal practice gathered from discussions at recent veterinary meetings. Such notes give the general practitioner much needed help and places before him the latest treatments and operations on the various lines.

Trusting it will be possible for you to have notes of this kind on all the various meetings, I assure you it will be greatly appreciated not only by myself but by all the various veterinarians who cannot attend all meetings. As we all know, the best and most helpful parts and discussions of the various meetings never find their way into print, and unless some one like yourselves take it upon themselves to gather this information and publish it, the general practitioner has lost a great deal of the benefit.

I have looked through your journals for something on the diseases and treatments for foxes, but have found very little in any journal that is of much value to the case I have in mind, which I would like to relate to you and have your opinion as to cause and treatment.

A silver fox farm located about 40 miles from my office has recently been having losses among their foxes.

The first fox that died about six weeks ago was treated by a brother practitioner, and on postmortem examination nothing was found to account for the sickness and death of the fox. About three weeks after the first fox died, a second one was taken sick and just within the last few days I have been consulted about the third fox, which was taken sick with exactly the same symptoms of the first two.

The only one I got to see was the second one, and that after death, when I held an autopsy. The first symptom noticed was a staggering gait and more or

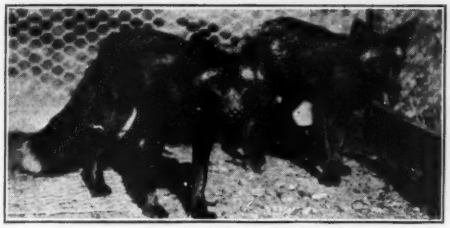
less dullness, capricious appetite, some days it would eat and some days it wouldn't, it even ate some on the afternoon preceding the evening it died. Its movements were very staggery—would walk around as though partially blind and bump into things with a slight tendency to walk in a circle. Slight bloody tinge to the bowel movement.

Postmortem—On opening the thoracic cavity, lungs and heart appeared normal; pyloric portion of stomach showed slight congestion. Around the opening of the gall duct into the bowel, there was a large area of intense inflammation. The gall duct seemed to be occluded, so that the gall bladder was tensely distended, and one section was found to be full of coagulated mass of the color and consistency of liver, and was just about as firm as liver—could be sliced down, no liquid whatever of any kind in the gall bladder. The liver seemed to be congested and slightly harder than normal. There was no discoloration of the mucous membranes as you would expect to find in jaundice—the remainder of the bowel was practically normal with the exception of a very few slightly inflamed areas. All the lymphatic glands appeared to be normal. Special search was made for intestional parasites but none whatever were found. The kidneys and bladder appeared normal as did the spleen and other glands.

I might mention that fecal examinations has been made of all foxes on this ranch, with the results showing light infestation with hook worms, for which they have been treated with carbon tetrachlorid. The last treatment for worms was given some time last fall. Until I held this postmortem, it was my opinion that the cause was some form of food poisoning, possibly botulism, but after holding this necropsy, I am at a loss as to the cause or proper treatment.

Any information you may be able to furnish, will be greatly appreciated, as they have over a hundred foxes on this farm, and treating foxes is something entirely new to me.—C. S., Penn.

Reply: From your description, I am rather inclined to believe that you will find ultimately that the cause of disorders in the foxes is of dietary origin. I would suggest that all feed pans or other utensils be thoroughly cleaned and disinfected and that, if possible, a complete change of the diet be made, by which I mean to substitute food stuff of the same food



A Pair of Good Ones

value or same kind but from a different source than the feed obtained at this time.

On one silver fox ranch near here there has been several losses due to distemper. From your description it appears there was no rise of temperature in these particular animals, and you will recall that one of the symptoms of distemper is the fact that there are at least two periods in which the temperature is high and at other intervals the temperature subsides to normal or subnormal. Is it possible that these foxes are afflicted with an atypical type of distemper?

On the ranch above mentioned, Sero-Toxylin has been found of very great value in checking a spread of the disease to other animals on the same ranch.

Allen (Theory and Practice of Fox Ranching) gives the following among a variety of symptoms of distemper in foxes. Flakes of mucus and blood may be seen floating on the surface of liquid faces, but not invariably. . . . The affected fox will stagger around the pen, the wonderful smoothness in gait of the healthy fox is lost as a result of incoordination. . . . The appetite is capricious and sometimes in entire abeyance.

Among the post mortem lesions, Allen says there may be little or no evidence of the usual inflammatory changes. The whole intestinal tube may be inflamed or only strips of the bowel may show intense redness. The stomach is usually empty and its walls lined with stringy mucus. The liver is often engorged with blood and easy to break up with the fingers.

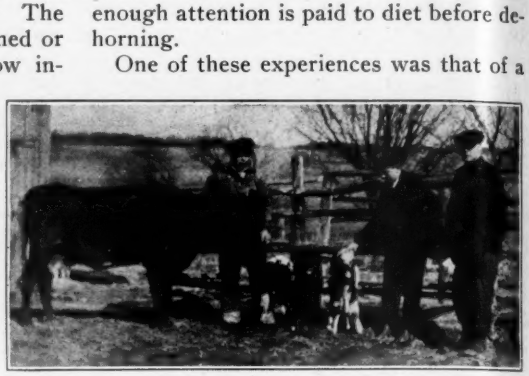
In summing up, he says: "Warning. If it were not for the technical difficulty in printing, I would have this sentence printed in red letters. Err on the safe side, assuming that a sick fox showing the least indication, is affected with distemper."

You may find articles dealing with foxes in the January and April issues of VETERINARY MEDICINE for 1925, and the January, July, September and October issues for 1926.—A. T. K.

DEHORNING FATAL TO CATTLE FED ON SWEET CLOVER HAY

While the practice of dehorning cattle is, from casual observation, apparently diminishing through the influence of various factors, it is still very frequently a necessity. Several somewhat recent experiences seem to indicate that not enough attention is paid to diet before dehorning.

One of these experiences was that of a herd of eighty heifers near Alamosa, Colorado. The entire herd was dehorned during the winter months, and of the eighty, sixty-five died from loss of blood. For a period of thirty days prior to dehorning, the herd had been fed on immature sweet clover hay, and C. G. Lamb, State Veterinarian of Colorado, and others who were called in, were agreed that this diet was at least indirectly the cause of the loss. The blood of the young cattle on this diet would not coagulate and they slowly bled to death. It is interesting to note in this connection, and as a sort of control, that four other heifers from the herd of a neighboring cattleman, which had not been fed on immature sweet clover, were dehorned at the same time and none suffered from the experience.



Triplets delivered by Dr. C. D. Hornbeck, Deep River, Iowa. The cow is a Brown Swiss, the property of Mr. Clate Ladley, Deep River. She was bred to a roan grade bull. Two of the calves are roan, one is red.

Scotch Triplets, property of A. C. Hansen, Willias, Kansas. The dam is Lora, sired by Chancellor. The sire of the calves is Clansman, a straight Scotch. Photo Dr. B. W. Conrad, Sabetha, Kans.

When asked if, in his opinion, sweet clover would always produce this effect, Dr. Lamb replied—purely as an opinion, however—"I think so, if immature." When questioned concerning the effect of other grasses, etc., he indicated that so far as his experience extended, no others produce a similar effect.

While one or more similar cases have been reported from Canada, this is the only happening of the kind in the United

States so far as the writer knows. It was the consensus of opinion of those interested that neither the altitude or any soil peculiarity of Colorado, nor the season of the year had any effect in this case, and in this opinion the state veterinarian concurred. It is believed, therefore, that a similar loss might occur anywhere after the feeding of immature sweet clover hay. A warning was issued to all cattle growers of Colorado, suggesting that the feeding of such immature sweet clover be stopped thirty days or more prior to dehorning. The suggestion has been made, however, that cauterization might have prevented the loss in this case.

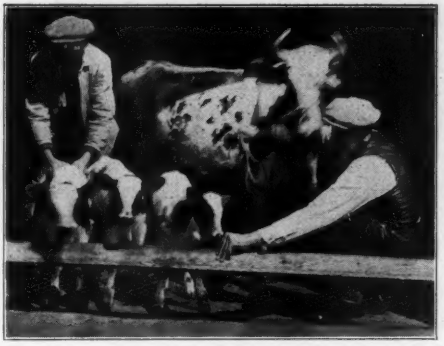
It may be that a warning similar to that issued in Colorado should go to all stock growers of the country. At least it can do no harm, and may prevent serious loss in dehorned herds.

Idaho Springs, Colo. Millard M. Rice.

HOLSTEIN COW SETS NEW KIND OF RECORD

On March 19, 1924, Aaggie Segis Calamity No. 83496, Holstein dairy cow, the property of Mr. W. E. Lawson of Hayfield, Manitoba, gave birth to a bull calf, and at the age of six months this calf was sold for the sum of $250.00. For a period of 353 days, which was her lactation period from March 19, 1924, she gave 19,215 pounds of milk with a fat content of 3.47; under the R. O. P. test supervised by the Department of Agriculture, Ottawa, Canada. On July 2, 1925, the cow gave birth to four normal living calves, of which three were heifers and the fourth a bull. Their exact weights at thirteen days of age, when the accompanying half-tone was taken, were as follows: bull calf 72½ pounds; heifer 60½ pounds; heifer 63 pounds; heifer 59½ pounds; a total weight of 256½ pounds.

Aagie Segis Calamity No. 83496 Holstein Registry and her quadruplets born July 2, 1925.



Upper left, Charles Hultman, owner; center, Bossie, chief performer, and right, Dr. O. W. Beiersdorf, Milford, Mass., obstetrician. Below, triplet calves dropped by Bossie on April 1st. Bossie is six years old and has six calves —a single at the first calving, twins at the second calving and now triplets. If Bossie can hold her ratio of increase for another calving she will eclipse Aagie Segis Calamity in prolificy.

This is the second set of triplet calves Dr. Beiersdorf has delivered since the first of the year, the other set being on the Clifford Dairy Farm, Foxboro, Mass.

Aaggie suffered from a severe attack of metritis following parturition, but on July 15th, 1925, when the photograph was taken, the cow's temperature was back to normal and she was commencing to gain, while all the calves were in one hundred per cent health. Dr. Harry H. Ross of Brandon, Man., treated her.

Mater Calamity and her four healthy calves made a round of the fairs in the Northwest in the fall of 1925 and took part in show ring contests.

December 26, 1926, less than 18 months after the birth of the quadruplets, Aaggie

presented her owner, now a Mr. Malcolm of McGregor, Manitoba, with twin calves—a heifer and a bull, giving her a family of six under the age of 18 months.

MAY 22 '27

SIDE STEPPING A SETTLEMENT

A well to do man in my town owned several farms throughout the country. He was one of those fellows who did not believe in improvements and would promise a man anything to get him on a farm and then give him nothing after he was there. The class of tenants he usually got was the fellows who had nothing, were satisfied with nothing and made nothing. Whenever I received a call from the tenants on any of these farms I always knew that if I went out it would be a charge account at the best and usually a complete loss. However, my policy has always been to give every man one chance, (providing there is no great deal of material used) and then if he does not make good I always have a good excuse to turn him down next time.

One morning I got a call from a tenant on Mr. G.'s southwest farm. The name was a new one to me, and knowing the class of tenants Mr. G. usually got I said to myself "Well that's another gratis call if made but as things are quiet I'll just make it any way and get acquainted." So out I went. After I had finished my work the new client said, "Well Doc, how much do I owe you?" This was quite a surprise as I was used to having them say, "Well I haven't any money right now but will be in some time next week and settle up." So I said, "Oh, ten dollars." He said, "Well that's reasonable enough, but I don't believe I have that much on hand right now. I will go in the house and see." Se he went to the house and I began to look about for something to lay claim to in case he was short. I had picked on some pigs that were eating corn from a large pile in the barnyard. When my client came out he had a five dollar bill which he gave me and said, "This is all I can find now, but I'll be in next week with the rest." So I said, "Well, we can settle right now as I can use one of those pigs or a few sacks of that corn," and here is how he slipped away. His answer was "By gowl Doc, I'd like to settle with you that way but those hogs and corn don't belong to me. The hampshires belong to that neighbor over South and the reds to the neighbor on the East, and the corn belongs to my landlord." I still have five dollars coming. However I have had my money's worth laughing about the settlement, and seeing others laugh when I told them how this fellow side-stepped me.

Mitchell, S. D. G. G. Faber.

APHOSPHOROSIS IN CALVES

After reading the article in May issue of VETERINARY MEDICINE on page 213, by L. W. Iowa, I am reminded of somewhat similar cases I had while practicing in Northern Indiana thirteen years ago.

My cases were calves around four or five months of age, which were well fed and allowed the freedom of a box stall. They were apparently in a thrifty condition when suddenly they would be found unable to arise.

They had no elevation of temperature or accelerated pulse and would eat. They looked bright and in fact you could not discern any ailment until you tried to make them arise, when they would make no effort to do so, and when lifted bodily and their legs straightened out, it was impossible for them to support their weight. Their legs would collapse. They would usually live for ten days and then die.

Various lines of treatment were tried with no success until I used phosphoric acid, and every case yielded where I used phosphoric acid, 10 per cent—5 drams in one pint of water. To this, I invariably added some fluid extract of nux vomica and gave from one to two tablespoonfuls four or five times in the twenty-four hours.

If our querist will try this line of treatment, I would like to hear of the results. I would not suggest that he give more than an ounce of the solution at a dose, it is not needed, and perhaps a half-ounce would be just as effective regardless of the age.—L. N. P., Texas.